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ABSTRACT

This book outlines the process and outcomes of the EUROTECNET Self-Learning Competency research project that was launched in 1989. (EUROTECNET is a program designed to promote educational responses that will enable the European Community to create technological innovations in the workplace.) Part I, Technological Change and the Need for a Self-Learning Workforce, has six chapters: "EUROTECNET Enquiry on Self-Learning Competency and Technological Change"; "The Enquiry Process: A Cooperative Self-Learning Experience"; "Technological Revolution Entails a Knowledge and a Learning Revolution"; "Profile of the Self-Learning Knowledge Worker"; "Organisations for Self-Learning: Training Institutes and Enterprises"; and "Taking Steps towards a European Self-Learning Community" (Caspar). Eight chapters comprise part II, Issues Surrounding the New Learning Paradigm: "The Self-Learning Gamble: An Examination of the Issues Involved" (Carre); "Self-Learning Competency: Approaches and Experiences in the Federal Republic of Germany" (Bahr); "Developing Skilled Learners: The Experience of ICI and Shell in the United Kingdom" (Pearn, Downs); "New Starting Points for European Vocational Training" (Feldmann et al.); "The Need for Self-Learning Organisations as Part of an Overall Business/Management Strategy" (Pedler); "The Utilization of Information Technology: A Management Perspective on a Learning Issue" (Docherty); "The Self-Qualifying Organisation: A Necessity for the Future of Europe" (Talpaert); and "Vocational Training Requirements within a Company Context: A Trade Union View Point" (Steinleitner). In conclusion, "Facing up to the Challenge" urges action to convert the self-learning model into a reality. The book contains a list of the names and addresses of contributors to the book. (Contains 125 references.) (KC)

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TASK FORCE
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YOUTH

DEVELOPING PEOPLE'S ABILITY TO LEARN

A European Perspective on Self-Learning Competency and Technological Change

by
Barry Nyhan

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Developing People's Ability to Learn

European Perspectives on Self-learning Competency and Technological Change

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Barry Nyhan

EUROTECNET
A Community Programme to promote Innovation
in Vocational Training
Resulting from Technological Change

Developing People's Ability to Learn

European Perspectives on Self-Learning Competency and Technological Change

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PREFACE

The EUROTECNET Programme aims to promote innovation in vocational training resulting from technological change. This goal could seem rather abstract at first sight, but the impact of the programme has to do with developing practical solutions to global problems. This book is a perfect illustration of this fact. In spite of its apparent modesty in scope and budget for a Community wide programme, EUROTECNET's results will have a far-reaching influence in the long term, as it is already recognised by many of those who have had the chance to directly participate in its different activities.

We are very pleased to present in this publication the results of a particular research and animation project undertaken by the EUROTECNET Programme, which has opened new perspectives on vocational training in a period of rapid technological change. The book we are publishing here is original in many respects, not only in its content, but also in the method through which is has been brought about. It illustrates one of the unexpected impacts of Community Training Programmes which consist in bringing together people from many different origins, cultures and educational backgrounds, to build together a conceptual framework for future common action.

This particular project was launched to respond to the need of finding new methods of learning in order to adapt the work force to the new challenges of technology. If knowledge and skills are to be developed to keep up with the pace of contemporary technological progress, there is no better way to do it than by developing, within the workers themselves, an ability to learn continuously, so that they will be in a position to learn by themselves spontaneously, right where they are, at the work place. The training answer to the challenge of technological change does not consist therefore, in increasing the number of ad-hoc external training activities, but seeing to it that the conditions through which workers will learn by themselves are created within their working environment. The final answer is that which the author of this volume has defined as a "self-learning competency" (SLC) and the "self-learning organisation".

But this goal could not have been achieved through a simple desk research activity, by intellectual isolated brain-storming in some hidden refuge. This is where the EUROTECNET methods took over, through which the living network of transnational innovatory projects, on which the activities of the programme are based, played its full role. The development of the concept of "self-learning competency" was thus secured by the common work of many who, jumping into the project at different times of its discovery trip, directly contributed to the common building of the concept and its application. Like most of the time in the education and training field, new methods and innovation are not the result of deductive discourses, but rather of the inductive work of many people building new ideas based on experimental approaches and living experiences. Training practitioners, coming from both training institutions and companies, experts and researchers, joined in this Community wide undertaking. This book is the result of that common effort. The readers are now invited to join in a similar discovery by means of a fascinating read.

While many have been involved, we would like to thank especially Barry NYHAN Senior Consultant, EUROTECNET Technical Assistance Office who, with the enthusiasm and conviction of a discoverer, was able to animate the whole exercise, forging embryonic ideas to launch the debate, formulating assumptions, reformulating concepts as the joint effort was progressing, animating workshops and leading the participants in the common self-learning experience which has characterised the developement of the SLC concept. Whilst far from being the only author of this book, Barry NYHAN deserves to sign it for, and on behalf of the other contributors, in recognition of the key role he has played in bringing the whole project to a successful conclusion.

Let us hope that this publication will further contribute to the improvement of vocational training methods and activities within the Community, and bring about the changes which are needed for Europe to face the challenges of the future. The EUROTECNET programme will thus have fulfilled its particular role among the training programmes of the Community.

The EUROTECNET TEAM
Technical Assistance Office

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PART I

Technological Change and the Need for a Self-Learning Workforce

Section One

The EUROTECNET Search for a New Learning Paradigm

Chapter 1

EUROTECNET Enquiry on Self-Learning Competency and Technological Change.

EUROTECNET is a programme concerned with technological change. Its purpose is to promote strategic and operational training-educational responses which will enable the European Community to effectively and continuously exploit technological innovations in the workplace.

The arrival of the computer based technological revolution in the early eighties can be dramatically portrayed, for the sake of argument, as having been met by two contrasting sets of expectations. The rationalistic and quantitatively oriented people in the industrial and business community (the "convergent" thinkers), felt that their troubles would now be over, and life would be simplified as a new electronic tool was on the market, at a reasonable price, which could be programmed to automatically and reliably control work processes, which up to now depended on unpredictable human beings. Artificial intelligence was just around the corner, so expert systems could provide the scientific information to the smaller number of people who would be required in the workplace. The problem of training and development could be resolved as businesses would be much less dependent on human beings - great!

The diametrically opposed response from another group, made up of a mixed assortment of people, some of whom could be classified as "divergent thinking types" who laid great value on creativity and responsibility - the unique human factors, some others among them worried about the autocratic nature of the new technology, and others who had a prized place in the labour market due to their specific social position, belittled the power of the computer, and resisted an examination of the possibilities it could offer. They stated that although new technology could address some problems more efficiently, 'it is not relevant to **our** situation'! Deep down, their attitude was one of abhorrence that computers should be allowed to contribute to the demise of human competence. Their viewpoint was that - 'if computers were to be accepted at all, they should be merely added on in certain situations without radically altering the traditional tried and tested systems'.

Much has happened in the meantime. The "computer hyper optimist" types have not had their naive fantasies fulfilled. Some of them undoubtedly have lost lots of money in the purchase of bad or wrong computer systems, while others have probably gone out of business by means of CAB (Computer Aided Bankruptcy!).

The "computer pessimists" along with the "new-Luddites" have also suffered a few shocks, as the computer revolution has pervaded all sectors of the economy. Technology has made an enormous impact on the way society and work is organised, from information processing in the service sector to telecommunications, to computer aided design and automated production in the manufacturing sectors. In fact if companies are to survive today they must use the new technologies.

However it is also being increasingly recognised that technology cannot be utilised effectively unless it is controlled by high levels of human competence, both of the "convergent engineering" sort and the "divergent human relations" kind. Technology must be used appropriately in line with business objectives and human resources backup. Technology is a human creation, implemented and monitored by humans for the benefit of their fellow human beings. The expectations of the "optimists" and the "pessimists" have both proved to be false therefore as the need for higher levels of human competence is seen to be necessary - "high-tech" means "high (human) touch"!

New Technology, Change and Learning.

New technology therefore has substantially changed organisational structures and the profile of the people working in them. It has introduced a speed and flexibility which calls for more sophisticated organisations, and more qualified human beings, who can direct this blind electronic hardware to meet appropriate economic and social objectives.

The widespread applications of automated systems is creating a more customer responsive service from design to delivery, leading to the decentralisation of management and production functions. Autonomous work groups which were seen in the 1960s, by many people in the business world as part of a job enrichment movement, are not being reintroduced in the interests of effective organisational design and greater profitability. There is a growing shift therefore from a vertical hierarchical model towards a horizontal company structure.

We are witnessing a workplace revolution which is reversing most of the patterns laid down by the industrial revolution of the last century. We are moving from the "hands on age" to what has been termed the "knowledge age". During the height of the Henry Ford production period, the role of the manager was to organise a way in which the workers on the assembly line could most cost effectively utilise their "hands", according to the so called "scientific management" principles. In the "knowledge age" however, hierarchical management cannot possibly control how brain-workers can best work with their minds and imaginations. We are therefore experiencing what can be called **second-order change**, in which the whole **work context** is changing.

If companies are to survive in the current age of the rapid and continuous technological change, which is triggering off and interconnected with global market, and business changes, a **re-framing of the whole context** needs to take place. This calls for **second order learning** by management, but also by the **critical mass of the workforce** if we are taking about horizontal and flexible organisations in a democratic society.

Reg Revans (1982), one of the founding fathers of "Action Learning", devised a formula which states that if an organisation is to survive, the rate of learning must be equal to, or greater than, the rate of change in the environment. (See Figure 1, Learning and Change)

Learning ≧ **Change**

Figure 1 : Learning and Change

Learning is increasingly being seen to-day by the successful companies as a major strategic weapon. This has major implications for Europe, which as well as responding to technological change is also at the present time preparing for the economic and social challenges of the

Single Market, and coping with the major developments in its central and eastern parts.

European companies and the people working in them therefore, need to develop the ability to be competent life-long learners who can cope with change. They must be able to continuously learn to master the most efficient new technologies and apply them in an effective way to meet their particular business objectives. This means that they must be able to anticipate change and cope with change in a creative way. They must be able to shape technology as well as respond to it. They must also be able to use the learning possibilities which are being offered by technology itself in the form of interactive computer based learning and multimedia systems, the many applications of which are currently being researched and developed by the Community's COMETT, EUROTECNET and DELTA Programmes.

> ***A modern European workforce therefore needs to be able to learn, and to re-learn continuously.***

Commenting on the relevance of the present education system to prepare people to live and work in Europe in the 21st century, the European Round Table of Industrialists stated that:

> "The technical and industrial development of European industry clearly requires an accelerated revitalisation of education and its curriculum." (European Round Table of Industrialists, 1989 p. 4).

If the European workforce therefore is to be equipped with the learning competencies needed to cope with a constantly developing technology, radical changes need to take place in the Educational and Training Institutes concerned with initial training and within Enterprises in relation to continuing training.

Self-Learning Competency

In order to respond to this issue in a practical way, EUROTECNET initiated and developed the concept of ***Self-Learning Competency***(SLC).

Self-Learning Competency enables people to actively learn in a variety of situations throughout their lifes. This means for example that people can:

- apply knowledge gained in one situation (dealing with a particular industrial/commercial process) to other situations;
- puzzle out a problem without giving up, or becoming too frustrated.

This competency makes people **aware of, and open to learning opportunities in their day to day experiences**. A workforce possessing this competency sees learning as an everyday natural occurrence. This kind of workforce is able to exploit learning opportunities which arise 'on the job', as well as make effective use of formal structured learning experiences, open learning and multimedia delivery systems.

The term **"competency"** in SLC is meant to focus on the development of independent self-learners as a **goal of training** as distinct from the narrower use of the term "self-learning", which refers to "individualised delivery systems", often utilising computer/text based packages.

The word **"self"** is intended to clarify the fact that the learner (the self), must take primary responsibility for his or her own learning, and that learning is an inner activity. SLC therefore means an active *self-managed* learning competency, which can be contrasted with its opposite, *a (passive) receptivity* to *being trained/educated.*

The word **"self"** in SLC also must not be interpreted in the narrow sense of learning alone. Effective self-learners are able to meet their own learning needs, and are able to learn alone in certain situations, but normally learning has a *social dimension.* A person learns through interacting with other people, organisations and events, or thinking about past and future interactions.

As enterprises are systems and not just collections of individuals, companies must also become corporate learners through learning from their experiences and so build up soundly based policies and structures which are also open to further developments. In this sense therefore one can talk about **self-learning organisations**.

SLC Enquiry

The EUROTECNET SLC Enquiry which was launched in 1989 sought to focus the minds of a wide variety of European experts and representatives, on the SLC concept, to examine its relevance, and to look at the implications of the **learning revolution** which needs to take place to respond to the technological revolution.

The Enquiry had the following broadly stated aims:

- to facilitate a European debate on the kind of "learning workforce" required by the modern technological enterprises;
- to examine the concept of "Self-Learning Competency"; and,

- to examine and describe ways in which European Training Institutes and Companies/Enterprises can change their organisational structures and methodologies in order to foster peoples' self-learning abilities.

This book outlines the process and outcomes of this Enquiry.

There are two parts to this book. The first part entitled **Technological Change and the Need for a Self-Learning Workforce** describes the methodology used by EUROTECNET to develop a new learning model, before going on to outline the Self-Learning Competency paradigm which emerged.

In Part Two of the book which is called **Issues Surrounding the New Learning Paradigm**, a number of papers are presented by authors from different European countries from methodological, company management and strategic viewpoints.

Part One of the book begins with the present introductory chapter. The next chapter entitled *The Enquiry Process- A Cooperative Self-Learning Experience*, relates how the initial formulation of the SLC concept was used as a launching pad to stimulate various European based activities, including a large conference, seminars, workshops and debates. In this chapter a flavour of some of the debates at the different events is presented, demonstrating the ways in which the **process** of the Enquiry was based on **cooperative self-learning lines.** This chapter which could be seen as covering the areas normally dealt with in a chapter on methodology, may not be of interest to those who wish to concentrate only on the **outcomes** of the Enquiry, which are outlined in the following chapters 3-6, which are grouped together to form a separate Section Two in the first part of the book.

Section Two of Part One which is entitled ***The Self-Learning Competency Paradigm*** synthesizes the main outcomes of the Enquiry. These outcomes portray the "European shared vision" about the new **self-learning knowledge worker** and the **self-learning organisation**, which emerged from the Enquiry.

This section comprises four interrelated chapters. The first of these chapters entitled *Technological Revolution Entails a Knowledge and Learning Revolution*, describes the impact which new technology has had on the way in which work is organised, and the knock on effects on the kind of integrated technological/business knowledge, required by what are called the "new knowledge workers". The nature of this "new" integrated knowledge requires a "new" kind of learning which can be termed self-learning. Although this chapter is of a rather conceptual nature, in evaluating its practical usefulness, the saying of John Maynard Keynes that "...ideas rule the world, and practical men are their prisoners", should be kept in mind.

The second chapter in this Section, which is entitled *The Profile of the Self-Learning Knowledge Worker*, describes the new learning person needed to cope effectively in a changing technological workplace. It deals with what could be termed, a re-definition of the kind of learning which the "skilled technological worker" must be able to undertake. The third chapter in this Section which is called *Organisations for Self-Learning - Training Institutes and Enterprises*, describes the kind of learning environment which promotes the development of self-learning workers and self-learning organisations.

The final chapter in this section by P.Caspar, and the concluding one of Part One, is entitled *Taking Steps Towards A European Self-Learning Community*. It summarises and highlights the key features of the self-learning paradigm, against the backdrop of a new Europe which must fully stretch the learning muscles of **all its members,** if it is to successfully face up to the future.

Part Two of the book which is entitled **Issues Surrounding the New Learning Paradigm** is broken up into three sections dealing with different issues related to the self-learning topic. The first section which is entitled ***Methodological Issues***, presents a series of papers from different European perspectives, by participants in the Enquiry, on the changes in methodology and style of training which need to take place, to facilitate the development of a self-learning and "higher-order skill" workforce. The first paper by P. Carré entitled, *The Self-learning Gamble: An Examination of the Issues Involved*, examines the emergence of the self-learning concept from a French perspective. W.H. Bähr looks at a series of different methodologies used in German Training Institutes and Enterprises to develop a learning competency in workers, in a paper entitled *Self-Learning Competency - Approaches and Experiences in the Federal Republic of Germany*. In the next paper, M.Pearn and S. Downs relate some innovative approaches used by enterprises in the U.K. to promote learning skills in their workforces. The title of their paper is *Developing Skilled Learners: The Experience of ICI and SHELL in the United Kingdom*. The concluding chapter in this section which is called *New Starting Points for European Vocational Training* by B. Feldmann, J. Kluger and J. Langenbeck, focuses on the need to adopt a pro-active planning strategy and a learner centred training approach, to deal with the higher level technological, process and social qualifications required in modern enterprises.

The two papers in the next section of Part Two, entitled ***Organisational and Management Issues for Companies***, deal with the changes which companies need to make in the way they are run, if learning is to be utilised as a strategic weapon. The first of these papers by M. Pedler, which is entitled *The Need for Self-Learning Organisations as part of an Overall Business/Management Strategy*, puts forward the concept of the "learning company" as a way to describe an organisation which is able to transform itself continuously in order to achieve its goals. The other paper by P. Docherty emphasises the point that if companies do not match technological investments with a similar one in human resources, they will be unlikely to achieve their business goals. This paper is called *The Utilisation of Information Technology - A Management Perspective on a Learning Issue*.

The title of the final section of the second part of this book is ***Critical Issues for the Development of European Continuous Learning Systems***. The two papers here look in a critical way at the manner in which enterprises and policy makers are presently formulating and implementing their continuous training strategies. R.Talpaert from the European Foundation for Management Development, highlights the urgent need to adopt all-embracing learning policies, which respond to the features of the new organisations in which power is shifting from the boardroom to the workshop. The title of this paper is *The Self-Qualifying Organisation - A Necessity for The Future of Europe*. The other paper in this section by K. Steitleitner, which is called *Problems of Vocational Training within a Company Context - A Trade Union Perspective*, looks at the rise of interest in vocational training, as is evidenced by the high public profile it is receiving in Germany. While pointing out the opportunities which this offers to establish systems to benefit all workers, and those who are unemployed, he points out the discrepancy between the espoused policies and the way that they are actually implemented in reality.

The concluding chapter in this book entitled *Facing up to the Challenge*, is a short one which highlights the urgent action which needs to be taken to convert the self-learning model into a self-learning reality. The paper summarises the key learning points of the Enquiry and challenges the different "actors" in the Policy Making, Business and Training/Education fields to play their part in building a European Self-Learning Community.

Chapter 2

The Enquiry Process : A Cooperative Self-Learning Experience

The Enquiry attempted, between January and November of 1989, to promote an exchange of views among people working in the training field, from different European countries, with the view to gaining insights into how a Self-Learning Competency (SLC) could be fostered in trainees, in the context of the new technology related training.

Because of the short time involved in the Enquiry, a pragmatic and experimental methodological approach was adopted. See Figure 2 - Stages in SLC Enquiry.

In the first place it was decided to write a basic paper on the topic and distribute it to a number of people from different European countries, working in the area of training and new technologies, asking them if they wished to collaborate with EUROTECNET in this endeavour. On that basis a group of Enquiry participants was established, who served as a "resource-network" which worked and learned together in the course of two European Conferences/Seminars and other smaller meetings and activities, to address the issues of the Enquiry.

Basic Paper

The basic paper which was written to provide a launching pad for the Enquiry (Nyhan, 1989a), argued that a new kind of person is needed for the new technological organisation. The paper took a definite stand with regard to the development of a life-long learning outlook and capacity as being one of the key objectives of technological training. Evidence was presented from many quarters to justify this stance. Arguments were put forward in a challenging, optimistic and future oriented manner, focusing on what **should** and **could be**, rather than what is. It set the tone therefore for an Enquiry which was openly developmental and action oriented, in a pro-active sense, as much as research focused.

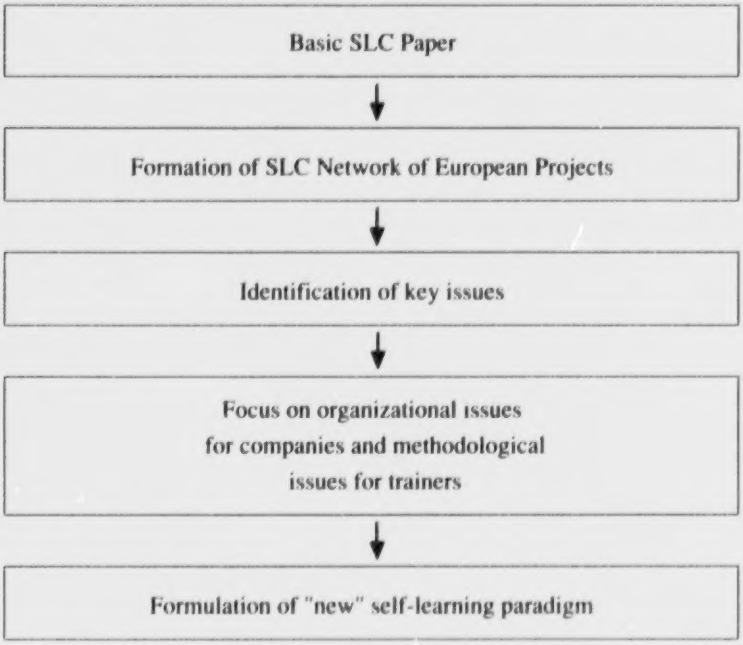

Basic SLC Paper
Formation of SLC Network of European Projects
Identification of key issues
Focus on organizational issues for companies and methodological issues for trainers
Formulation of "new" self-learning paradigm

Figure 2 : Stages in SLC Enquiry

The next step in the Enquiry after the completion of the basic paper was to invite EUROTECNET projects and other European practitioners and experts to collaborate with EUROTECNET in the Enquiry. Following the distribution of this paper a number of people expressed a wish to contribute to the exploration and development of practical ideas in relation to the topic. A kind of SLC network therefore was created. Twenty Six projects who were already members of the EUROTECNET network took part in the Enquiry. Other people participating, represented different European training bodies, public and private companies, representatives of the Social Partners from the European Community Member States, Sweden and Hungary.

Many of these had a high degree of expertise and had been working in fields related to the Enquiry topic for some time, while others had more limited experiences. The participants came from very different backgrounds- trainers, administrators, researchers, training designers, company managers, trade-union representatives etc. The decision was made to go for heterogeneity so as a comprehensive and "down to earth" debate could take place, which would more likely lead to the implementation of practical plans, to suit the specific contexts within which people were working. In all, about 100 people participated, at different levels of intensity, in the two Enquiry Conferences, meetings and other activities.

Identification of General and Key Issues

Fifteen EUROTECNET projects along with about twelve other European representatives attended the first Enquiry Seminar which took place in the Berufsförderungszentrum, (Bfz), Essen, FRG, in April 1989. The "NTK" project which participated in the SLC Enquiry, is located in the Bfz. The purpose of the seminar was to exchange general views in response to the original SLC paper, and to allow representatives from different European countries to relate relevant ideas and practical experiences. The seminar also identified the key issues to be addressed in the second large meeting of the Enquiry. (Nyhan, 1989b)

First Issue: Many interpretations of "Self-Learning"

During this Seminar it emerged that a great variety of interpretations of the meaning of "self-learning" existed. The first of these concerned the notion of the "**self**" in Self Learning Competency.

The original document (Nyhan, 1989a) outlined a comprehensive description of the "self" in SLC which gave people a standard, in relation to which they could take up their own position. In that document the meaning of the term "self" was portrayed as follows:

> "The word **"self"** in "Self-Learning Competency" is meant to highlight the fact that learning is primarily an **internal activity** taking place in the learner (**"in the self"**). Learning is due to the learner being aware, listening, enquiring, reflecting and interacting. This counter-behaviouristic description of learning is

common to many authors from different backgrounds such as: Bateson (1972), Piaget (1971), Schon (1983), Torbert (1972), Maritain (1943), Glasser (1986), Chomsky (1975), and Kolb (1984).

The "Self-Learning Competency" idea as defined here is not new. Maritain (1943, p. 32) stated that: "The actual merit of modern conceptions in education since Pestalozzi, Rousseau, and Kant, has been the rediscovery of the fundamental truth that the principal agent and dynamic factor is not the art of the teacher but the inner principle of activity, the inner dynamism of nature and of the mind". Condorcet wrote in 1792 that young people should acquire "l'art de s'instruire par soi-même", (the art of instructing oneself) so as they can continue learning throughout their life.

The origin of this concept can be traced back to Plato in Classical Greece in the 4th Century B.C. His exaggerated theory that all human knowledge is within people, and that learning is only becoming aware of this knowledge, has more than a grain of truth in it. The theory breaks down if carried to its logical conclusion, but there is a refreshing aspect to the way in which Plato acknowledged the power of the learner. He stated that teachers cannot "... put sight into blind eyes". Their role is to ensure that people begin to see things for themselves by "... turn(ing) in the right direction ... and looking the right way" (Plato, The Republic, p. 283).

The term "Self-Learning Competency" has a much wider meaning than the term "Self Learning" as it is often used in relation to "Open Learning", "Distance Learning" or Multimedia. These terms are commonly taken to mean people learning **alone** possibly by means of a learning package or a computer, at a distance from, and without face to face contact with a trainer. They refer primarily in fact to a **learning/training delivery system** as distinct from a **competency in the learner**. This learning delivery system could perhaps be more accurately described as "Individualistic Learning" or "Learning Alone".

"Self-Learning Competency" on the other hand focuses not on any particular delivery system, but on the learners' ability to learn in the variety of situations they find themselves . This is a question of **using** learning **opportunities** to **actually** learn. These opportunities may arise while learning with a trainer/manager, or learning with colleagues, learning in a group, learning while doing, learning by means of "Open Learning", computer based learning, or learning "accidently" (serendipity) and so on.

> Some "Self- Learning Delivery Systems" are designed on the basis of the passive learning (often rote-learning) model, and therefore hinder rather than foster a "Self-Learning Competency" (See Davies, 1987, p. 22). Even well designed "Self-Learning Delivery Systems" will only be successful if the learners have firstly cultivated a "Self-Learning Competency", which enables them to manage their own learning and so deal with the specific problems of learning alone"

The interpretations of the term *"self"* provided by the participants in the early stages of the Enquiry, reflected their diverse national, cultural, and linguistic perspectives. The different philosophical foundations to the definitions put forward were in evidence, including the Hobbesian individualistic perspective, the Carthesian intellectualist one, and the Socratic interpretation of "self", (in response to the Delphic inscription, "Know thyself"), which he saw as referring to the discovery of what "nature" defines to be the "self". The latter notion portrayed the "self" as belonging to a social context, in which one participates to achieve the "common good".

As the Enquiry proceeded a way of resolving these different viewpoints emerged. This meant putting forward **three complementary, interdependent and pragmatic definitions** of the self-learner, (taking heed of man's nature as a ***competitor*** and a ***cooperator***), which everyone who wants to live in the last decade of the Twentieth Century, must to a greater or lesser extent accept. (See Figure 3 - Three Complementary Definitions of The Self-Learner)

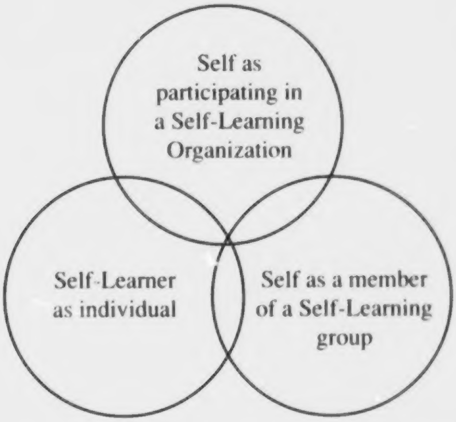

Self as participating in a Self-Learning Organization
Self-Learner as individual
Self as a member of a Self-Learning group

Figure 3 : Three Complementary Definitions of the Self-Learner

The first way in which a modern worker requires to be a self-learner is as an independent and mobile individual who can, due to a sound basic training and life-long learning ability, move between different work organisations, technological systems, be open to, and avail of further training opportunities, possibly become self-employed etc. This first definition refers to the "**self-learner as an individual**"

The second definition deals with the **"self" as a member of a "self-learning group"**, the "***group self***" being as much a reality as the "individual self". The modern person working with increasingly flexible and networked computer based systems, is called upon to cooperate closely with colleagues in planning and carrying out new tasks. This entails an openness and capacity to learn with, and from, the small work group one deals with every day. The performance of this group depends on its ability to plan, work and learn together, to solve long and short-term problems.

The third meaning of "self-learner" refers to the ability to participate in an organisation, (or a large "human system"), actively availing of, and contributing towards the formal and informal learning and development of the whole organisation. This "self-learner" is one who can participate in a **"self-learning organisation".**

The Meaning of Learning

The other terms of reference issues which emerged had to do with the different culturally bound terms to do with "learning", "training" and "education", and the fact that terminology used had many nuances which could not be satisfactorily translated into other languages. The distinction between the word "learning" and the word "training", for example, does not have the same clear cut meaning in the French and Danish languages as it does in the English language.

The word "learning" itself is not an unequivocal term. Learning in the sense of increasing one's understanding is obviously good, but "learnt-helplesness" is a very different matter. A distinction can also be drawn between the learning of rules and procedures and learning which involves understanding and mastery. These different levels of learning **content** entail different learning **methods/processes**, ranging from passive rote learning to active problem solving learning. The implications of this are that learning has to be analysed in terms of two axes, learning **content** and learning **process**, as depicted in Figure 4: Learning Content and Process.

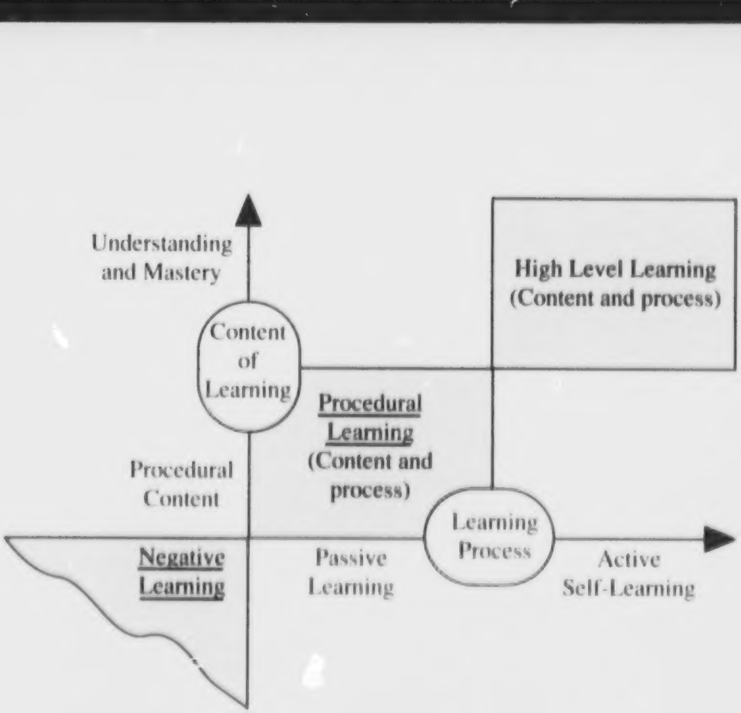

Understanding and Mastery
High Level Learning (Content and process)
Content of Learning
Procedural Learning (Content and process)
Procedural Content
Learning Process
Negative Learning
Passive Learning
Active Self-Learning

Figure 4 : Learning Content and Process

The type of learning implied by the term SLC, which can be defined as:

> *an active power within people, making them engage continuously with all of their experiences (in an open and enquiring way), to understand and master them,*

refers to the "High Level Learning (Content and Process)" in the top right hand corner of the above diagram.

Even though there were differing views and perspectives on the meaning of Self-Learning Competency, during the first stages of the Enquiry, participants' definitions tended to broaden rather than become narrower. There was a general consensus however about the need for a more complex form of learning brought about by new technology. The need for a new "learning paradigm" was recognised. The ability to learn was seen as one of the "key qualifications/competencies" required by the modern professional worker, who needs to increasingly exercise a greater degree of autonomy in the "new" technological organisation. The need to radically change the learning environment to foster more active forms of learning was also recognised. It was felt that learning ought to become problem solving oriented, and individual needs ought to be taken into account. Trainers ought to be seen as assistants/partners in learning rather than "skills and knowledge dispensing agents". (See Bähr, Carré and Pearn/ Downs in this volume.)

Although there was a broad agreement about the value of Self-Learning Competency, the number of training institutes and work organisations actually implementing the idea in a significant way, was considered to be quite small. Some of the participants had difficulty in visualising a workable self-learning environment. Others were struggling to come up with practical models which would fit in with their presuppositions about how learning and training take place, and which could be integrated with existing systems.

Company Organisational Issues and Methodological Implications for Self-Learning.

Two distinct but interconnected issues arose during the course of the first Seminar. One concerned the kind of **organisational and management systems** which ought to be in place in the enterprise or company to facilitate self-learning activities and promote self-learning workers. Unless enterprises structure their work organisations along autonomous (self-directing) working group lines, the chances for self-learning to become a reality, are very limited. This was considered a critical issue, because if companies try to implement self-learning as the latest fad, without understanding that they need a new model of management, then the experiment is going to be a dismal failure. Learning Methodology in fact must mirror organisational attitudes and values.

The second concern had to do with the needs of **trainers**, (and **those in charge of training institutes and training departments**), who have to implement self-learning practices on the ground. What changes do they have to make in their roles, how do they change and what new techniques can they use?

It was felt that these two interrelated issues, the first one dealing with company **management policy/value issues**, and the other dealing with **methodological issues**, were the important ones which the remaining period of the Enquiry should address. To tackle these in a way which would enable participants to look at the concrete reality of self-learning, and move on from merely theoretical discussions, it was decided that the next major and final "event" of the Enquiry should follow an actual **self-learning design.**

The focus of the next event therefore was on asking people to bring their different experiences and practical ideas to the forthcoming conference, to reflect on them, and identify the factors which promote people to be self -learners. This Conference which was entitled "Developing People's Ability to Learn Continuously-Goals and Methods" took place in Maastricht, The Netherlands, in November 1989 and was attended by 70 people from the public and the private sectors. (Nyhan, 1990).

The conference was broken up into two working groups, under the direction of two teams of tutors/consultants, to deal with the two themes. One group dealt with the **strategic issue for managers of companies** who wish to build self-learning organisations, and the other concentrated on the **concerns of trainers** who wish to implement practical techniques which will enable people to become self-learners.

Issues for Company Managers

The "Companies" group brought illustrated case studies with them, based on experiences of innovative self-learning oriented experiences within their organisations. On the basis of these experiences and the workshop reflections, certain principles for action were extracted. To give an overall flavour of that conference some of the key conclusions which emerged are briefly treated below. A fuller treatment is provided in a broad way in Chapter 5 (Nyhan) and also in Chapter 12 (Docherty).

In this workshop participants were requested to present their **own experiences**. This focused attention on the participants as a group of experienced "experts", who were learning together in a peer learning fashion. The fact that participants were reflecting on events which had taken place, also gave a credibility to the discussions, reminding one of the saying of one of the characters in Iris Murdoch's novel " The Black Prince" that: "Men truly manifest themselves in the long patterns of their acts, and not in any nutshell of self-theory."

Some of the key **principles for action** which emerged from this workshop (and which will be treated in more detail in later chapters) were :

- The control system operating in a company supporting self-learning activities (a self-learning organisation), must be built on internalised values and norms.
- To ensure success top management must manifest its involvement and play a visible role.
- Joint reflection activities, including regular systematic feedback sessions, need to take place.

- Learning should be problem/needs driven as distinct from being technique driven, and should be integrated with the work itself, through putting a "semi-formalised" structure on informal "on the job" learning.

Methodological Issues for Trainers

The second workshop group had the task to identify the practical methods which trainers could use to promote people's learning competencies. This group firstly went through a **common experience** in which they had to learn, in a self-learning group context, (with the use of written materials, computers, assistance of tutors etc.), to solve a technical/commercial problem, which was presented to them at the beginning of the workshop. Afterwards they were asked to reflect on their experience, to discover the ways in which they had tackled their learning, and in particular how their self-learning abilities had been developed/not developed, during the exercise. This in turn led to the identification of some practical pointers which trainers could use in developing trainees' learning competencies. These are briefly treated below, and in more detail in Chapter 5 (Nyhan) and Chapter 10 (Feldmann, Kluger and Langenbeck).

This workshop encountered difficulties in the first phase of the exercise. Partly due to a bad start to the proceeding, many of the participants were confused about the distinction between the purpose of the simulated technical/commercial exercise they were doing, and the overall goal of the workshop, which was **to reflect on how they were learning.** In the reflection phase, in the second part of the workshop, the difficulty for learners, to operate at two levels, one dealing with *process competencies* (such as thinking and learning), and the other dealing with *product competencies* (such as solving an actual technical problem), simultaneously in one training activity, was recognised. The confusion caused by this had a debilitating effect on some of the participants. Another stumbling block which this workshop encountered, (and which many self-learning programmes tend to come up against), was the fact that the self-learning exercise involved throwing experienced and competent people into a situation where they no longer felt competent, that is, having to deal with a relatively simple, but at the same time, a new technical problem, while working alongside people whom they had met for the first time the day before.

The risks involved in the design of a workshop, simulating a "live" self-learning situation, with participants from nearly all of the Member

States, were recognised in advance by the organisers, who were therefore not totally surprised by the events which unfolded. With hindsight, taking into consideration the heterogeneous nature of the group, the fact that for many of them it was their first experience of self-learning, and the time constraints, a different structure for this workshop could perhaps have been designed.

The workshop however was very successful in demonstrating some of the problems which trainees are likely to experience in undertaking self-learning activities, which by their very nature deal with exploring the unknown. It also illustrated in real terms, the situations which trainers are likely to face when they are introducing confused and sometimes resistant learners, (who may prefer to be "instructed" or "taught" in the traditional way), to the world of self-learning.

The reflection phase of the workshop, which was very animated, also brought to light some other key insights about the self-learning process such as:

- The importance of establishing learning goals with trainees at the beginning of a self-learning exercise, which is the critical phase in learning. This is the key to motivation.
- Even though people begin a learning process very slowly and with feelings of uncertainty, enormous and unexpected progress can be made in acquiring new technical and "learning" insights, (as was the case in the workshop).
- Group cooperation is a key factor in dealing with uncertainty, hence the key role of group work in learning - self-learning groups.

At another EUROTECNET seminar dealing with the theme of "Training the Trainers", held at Maastricht, NL, in September 1989, participants went through a brief self-learning experience as a launching pad for a discussion on its relevance to a retraining programme for trainers. The main point which emerged in the discussions was that the introduction of self-learning methodologies will demand trainers, (and trainees), to take on new roles, to which they will need time to adjust. Although the arguments for self-learning make complete sense to most trainers, it is to be expected that they will experience a "culture shock" in dealing with the practical implementation.

Relevance of SLC to Computer Integrated Manufacturing

The relevance of the application of the SLC concept to "Computer Integrated Manufacturing" (CIM) was also examined.

At the EUROTECNET CIM Week Conference at Stuttgart in November 1989, a paper on SLC and CIM (Nyhan,1989c) was perceived by participants as responding to the needs for higher levels of competence in dealing with advanced technologies. One of the central points repeated by many of the speakers and participants at that conference, was that CIM does not mean de-skilling the workforce, but requires highly skilled people who can exercise autonomy, carry out independent planning and engage in team-related problem solving. All of these require a self-learning competency.

Final Point

To conclude this chapter dealing with the Enquiry as a self-learning exercise a final point can be made.

In attempting to achieve its aims, the Enquiry followed what could be termed, a structured self-learning model. It doing so, it went through the classical "trial and error" self-learning cycles. It was a practical demonstration of the theoretical model being debated. The "self-learning network hypothesis" states that if people come together from different backgrounds in a sincere and coordinated way, to reflect on their experiences with a specific focus, then synergistic learning can take place. A small step towards the validation of this hypothesis, in a European context, was taken by the people who participated in this Enquiry.

Section Two

The Self-Learning Competency Paradigm

Chapter 3

Technological Revolution Entails a Knowledge and a Learning Revolution

The Computer/Informatics sector at the present time has a 5% share of Europe's gross national product, and is expected to double by the end of the century. That will make it larger that the automobile and the steel sectors. As well as being a manufacturing cum service sector in its own right, its products are being extensively utilised by the other sectors of the economy to improve their productivity. Besides the economic influence of the new technologies the socio-psychological impact has also been very profound.

Each era of major technological advancement affects the manner in which people understand and visualise their world. Bolter (1986), arguing that technology is as much a part of classical Western culture as philosophy and science, pointed out that just as Plato and *pottery* must be taken together in order to understand the ancient Greek world, and Descartes and the *mechanical clock* must go together in order to understand Europe in the seventeenth and eighteenth century, so must the **computer** be seen as the *technological paradigm* for the philosophy of the coming age.

New Technology has forced human knowledge and competence to move on to a new plane because it has captured and has automated much of the low level knowledge. Marshall McLuhan pointed out as long ago as 1964, that "... the electronic age suddenly releases men from the mechanical and specialist servitude of the proceeding machine age. As the machine and the motorcar released the horse and projected it onto the plane of entertainment, so does automation with men. We are suddenly threatened with a liberation that taxes our inner sources of self-employment and imaginative participation in society"

During the course of this Enquiry one could observe people struggling to come to terms with a new reality and a new knowledge, which was having unexpected knock-on effects. Quite literally the old terminology was proving to be inadequate to describe the qualities and characteristics of a workforce which could manage the new situation. People were grappling to describe the new "content" of learning, the new learning process and the new learning system, hence the birth of a host of new terms such as "self-learning", "open and flexible learning systems", "organisational learning", "learning resource units", "technology based learning" and so on.

During the preceding years, even before computerised technologies became all pervasive, the meaning of certain training words was stretched to indicate something much broader than what the words originally meant. The word "skill" for example began to be used to convey something very different from that of its original psychomotor meaning. It was used to refer to the ability to think, to relate to people, ("intra-personal" and "inter-personal" skills), and to a much more expanded range of human activities. The term therefore began to increasingly take over spheres which were previously seen as coming under the heading of knowledge and understanding. It was preferred to the word "knowledge" because of the latter's overly academic, abstract and "non-action" associations.

Today however with the upsurge of computer and "human resources" related "intellectual actions", the use of the term "knowledge" is being used much more in vocational training spheres. (See Caspar and Talpaert in this Volume). Industrial production is now described as being "knowledge intensive" as distinct from being capital intensive. The kind of knowledge that is required today is of the **"practical knowledge"** variety, the kind which **directs action**. This practical knowledge is seen as combining *multifaceted technological and social* aspects. By providing a vehicle for integrated communication, Computer Integrated Manufacturing is for example demanding *integrated knowledge*. This knowledge is also increasingly being seen as related to the release and control of other human competencies dealing with attitudinal and emotional dimensions such as creativity, flexibility, coping with change, commitment etc. This definition of knowledge is of a different variety to the rationalistic dead knowledge which can easily be converted into mechanistic skills. The latter type of knowledge possibly influenced Einstein to make his famous comment that "imagination is more important than knowledge".

The technological revolution therefore has occasioned a new kind of complex knowledge which has to be looked at in terms of **context as well as content.**

Content and Context of the New Knowledge: Interdependent Technological and Organisational Dimensions

The modern worker has to be able to deal with the interdependent technological and social-organisational dimensions of work. Many of the dramatic changes in the organisation of work over the recent years, have in fact been triggered off by the introduction of new technology, both of which in turn have given birth to the "new" knowledge (See Figure 5 - New Technologies: New Forms of Work Organisation: New Knowledge)

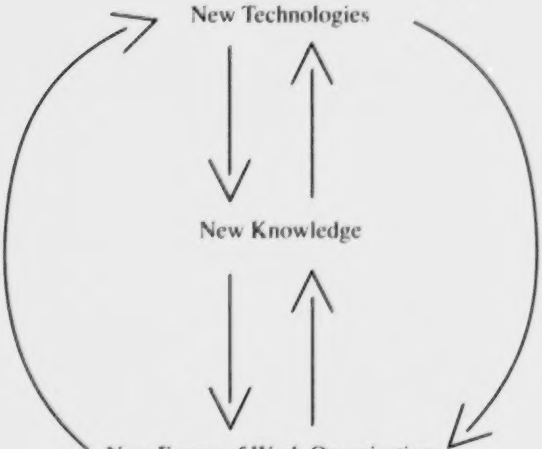


Figure 5 : New Technologies : New forms of Work Organisation : New Knowledge

The current situation has been described as follows:

"We are now experiencing a radical shift in which the technology will magnify and extend the meaning of the new forms of work and knowledge. What the new organisational paradigm and new

> technology have in common is that both are based on the release of human capabilities. This makes the present technological revolution, at least potentially, a "knowledge" revolution " (van Beinum, 1988).

A critical role for modern technological organizations (and skilled workers) is not so much taking on new technologies, as **handling their applications** and dealing with the effects of technological developments. The new types of work organisations have to be flatter and more decentralised in order to respond to shorter product cycles, and deal with the individualised needs of customers which can now be met by means of new technology. The new worker has to be a "self-managing type" capable of taking responsibility for company decisions in the workshop and the market place. This worker is the one dealing with the companies' "moments of truth" in which business is won and lost.

The present phase of new technological developments, has contributed greatly to this redistribution of responsibility. In the early days of computerisation, huge mainframe computers operated by a few technical specialists in central data processing departments, dealt with the whole organisation's computing needs. Nowadays however the introduction of powerful and user-friendly desktop Personal Computers has turned everyone into a computer expert, while central EDP units have lost overall control. Lower prices have enabled department heads to buy PCs without boardroom approval while innovations such as a Graphical User Interface (GUI), made popular by Apple Mackintosh and currently being developed by other software houses, have allowed even the least computer literate users to start writing their own programmes. The use of these powerful and organisationally networked tools and machines, are giving production and service workers responsibility for influencing the companies business performance. Because they are using "mental", software-driven equipment, they cannot be monitored in the same way as before. "Power is therefore moving from the boardroom to the shopfloor" (See Talpaert in this Volume).

A recent study on regaining control of IT investments by a British research unit concretely illustrates how the introduction of new technology leads to the creation of these new responsibilities and control structures. Key people at *all* levels are required to take more decisions and to carry responsibility for these decisions. (Hochstrasser and Griffiths, 1990)

As well as knowing about the **specialist and technological content** of their jobs therefore, the modern technological workers also need to know the **business and organisational context**. (See Docherty in this volume.)

The optimists remind us that the technology revolution gives us an ideal opportunity to revamp the workplace in such a way that social and technological processes can be integrated satisfactorily, (Van Beinum, 1988). In this manner we can leap beyond the "labour enslaving phase" in which man served the machine, and the "labour replacing phase" where the machines were expected to replace their slaves, and move into a new "labour enhancing" phase in which the latest technologies are at the service of man. Shaiken outlines how automation can be designed in a way which enhances human skill, or in a way which degrades or eliminates it. It is in the long-term economic and social interests of democratic society to invest in the competence of the workforce. (Shaiken, 1984)

Examples of the New Integrated Knowledge

An example of the higher level of integrated technological organisational and business knowledge required by people working in a Computer Integrated Manufacturing environment, discussed at the EUROTECNET CIM Week in Stuttgart in November 1989, is outlined below.

Skilled CIM workers must be able to:

- understand the overall method of production in the system, handle a great deal of technical information, so as to take decisions on the spot;
- cope with uncertainty and assess situations as they come up, find and interpret faults rapidly and correct them.

In the banking and insurance world which has been affected by new technology perhaps more so than any other sector, while lower level skills such as data entry and data processing are disappearing, the new emerging competencies for the higher levels of the workforce are concerned with broader and less specialised tasks, focused on assisting customers and problem solving. (See Figure 6 - The Changing Nature of Skills in Banks and Insurance Companies.) New Technology is giving people the freedom to work at this higher level.

Old Competencies	New Emerging Competencies
1. Ability to operate in well defined and stable environment	Ability to operate in ill defined and ever-changing environment
2. Capacity to deal with repetitive, straitghforward and concrete work processes.	Capacity to deal with non-routine and abstract work process.
3. Ability to operate in a supervised work environment	Ability to handle decisions and responsibilities.
4. Isolated work.	Group work ; interactive work.
5. Ability to operate within narrow geographical and time horizons.	System-wide understanding ; ability to operate within expanding geographical and time horizons.

Figure 6 : The Changing Nature of Skills in Banks and Insurance Companies. (Bertrand and Noyelle ,1988)

The breaking down of clear boundaries between jobs due to new technology, has had a particular impact on the publishing and printing industrial sector, with the elimination of some of the traditional stages in the composition process. In a submission to a joint committee on the newspaper industry in Ireland in 1986, newspaper publishers expressed the view that all employees in the industry can be seen simply as 'Newspaper People', and that technology will continue to blur traditional demarcation lines. (Social Europe, 6/89)

Definition of the new knowledge

The kind of knowledge required by the technological worker can therefore be defined as :

> ***understanding what you are doing in effectively dealing with situations, which have interdependent technological, organisational and business components.***

Goranson and Josefson (1989 p. 4) speak about "knowledge that cannot be generalised; the type of knowledge that makes a skilled person able to make assessments and take action in unique situations"

Shaiken (1984, p. XII) portrays skilled workers as being able to make "a creative response to uncertainty based on experience, ability, and the needs of the situation".

This "new knowledge" can be called **holistic, integrated and situational** knowledge and contrasted with the Tayloristic compartmentalized knowledge based on generalised procedures and rules.

New Learning Paradigm

This knowledge can only be acquired in a self learning context. (See Figure 7 - New Self-learning Paradigm). It cannot be taught in the traditional sense, nor can it be acquired as part of the body of skills in initial training. The source of much of this integrated and situation specific knowledge has to be the experiences in the workplace. (Fragnière, 1989, p. 19). If the worker is to be capable of extrapolating learning from these experiences, which then becomes part of his professional profile of skills, he/she requires a Self-Learning Competency.

The learning paradigm required for the technological age is a self-learning one. As it is becoming impossible to train people for the future, vocational training institutes in initial training have to adopt the self-learning paradigm rather than the training one.

The training paradigm is concerned with implanting "fixed patterns" in people in the expectation that they will be valid for a great number of years. Rather than "being trained" today, people need "to learn how to learn".

The adoption of the new paradigm cannot take place without major organisational/structural/curriculum changes in European Initial Training Systems. The way to become a self-learner is to **practice** being a self-learner during Initial Training. This cannot be done in the traditional instructing/teaching fashion. So training organizations and training staff will need to adopt new learning structures and methodologies to carry out this task.

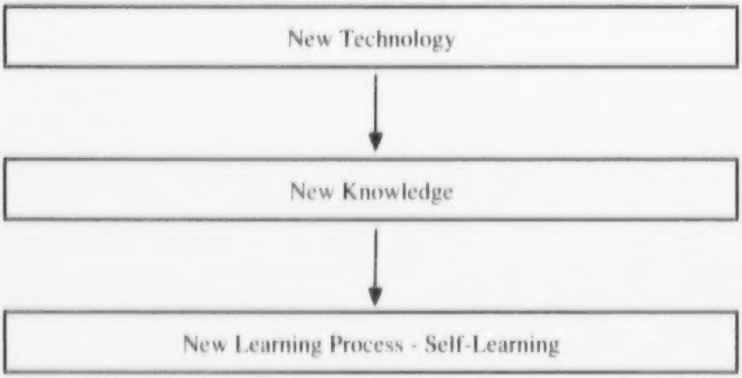


Figure 7: New Self-Learning Paradigm

For work organisations to adopt the new paradigm the changes which need to take place are equally dramatic. If learning is to become a "natural process" and "as natural a part of the job as swapping tools", then management will need to know how to introduce and manage such a system. The enormous potential made available by the new learning technologies such as Distance learning, Multimedia learning, Flexible Learning and so on, can only be exploited if management possess the "know-how" to do so.

The implications of these changes for training institutes and companies will be considered in more detail in Chapter 5 following a description of the profile of the new learning-worker in the next chapter.

Chapter 4

Profile of the Self-Learning Knowledge Worker

The learning competency of the modern workforce (SLC) was seen by the European projects who participated in the Enquiry as one of the integrated set of the "**core competencies**" required to deal with the new "knowledge based work organisations" described in the previous chapter. The term "core competencies" is used to describe those attributes or deep-rooted human qualities such as- ***the ability to take initiatives, engage in abstract thinking, work in a team, self-learning competency*** *and so on.* They are called "core" because they form a central or kernel (core) dimension of different occupational contexts and even different occupations. (See Figure 8 - Core Competencies: A Kernel Dimension of Different Occupations/Professions).

These core competencies were seen to be essential to respond to today's "knowledge based technological-industrial revolution". They are "process competencies" which transfer across different occupations as distinct from what can be termed "product skills", which are linked to specific occupations/professions. In the Enquiry even though they were referred to by a variety of different names, by participants from different European countries, reflecting their own special cultural backgrounds, both conceptual/philo-sophical and linguistic, there was a general consensus about the essential nature of these core competencies. A sample of some of the different European terms used to depict the same reality is given in Figure 9 - A Sample of Different European Terms for Core Competencies)

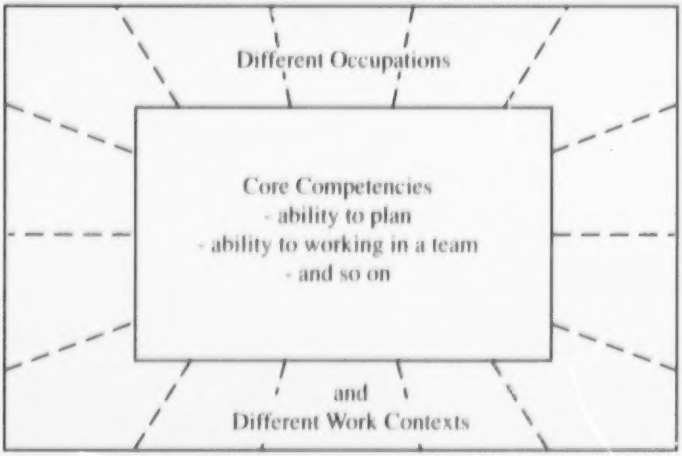


Figure 8 : Core Competencies : A Kernel Dimension of Different Occupations/Professions

Compétences Transversales (Crossing or Transferable competencies)	F
Common Skills	UK
Sapere Essere (Knowing how to be)	I
Schlüsselqualifikationem (Key Qualifications)	FRG.
Personal Effectiveness (Self-Organising Attitude)	IRL
Procesuafhængige Kvalifikationer (Process-Independent Qualifications)	DK

Figure 9 : A Sample of Different European Terms for Core Competencies.

The Central Place of Self Learning Competency

The other core competencies are dependent on Self-Learning Competency in a special way because learning is the means by which people gain and revitalise their knowledge and competencies. The new "knowledge worker" has to continuously renew his/her knowledge, and so out of necessity has to be a "learning worker". The only way in which modern workers can acquire to-day's complex "living", ever changing knowledge, is to learn it for themselves through a continuous active self-learning process - nobody else can do it for them. The person who has this ability can be described as a **"self-learning knowledge worker".** (See Fig 10- Self-Learning Knowledge Worker).

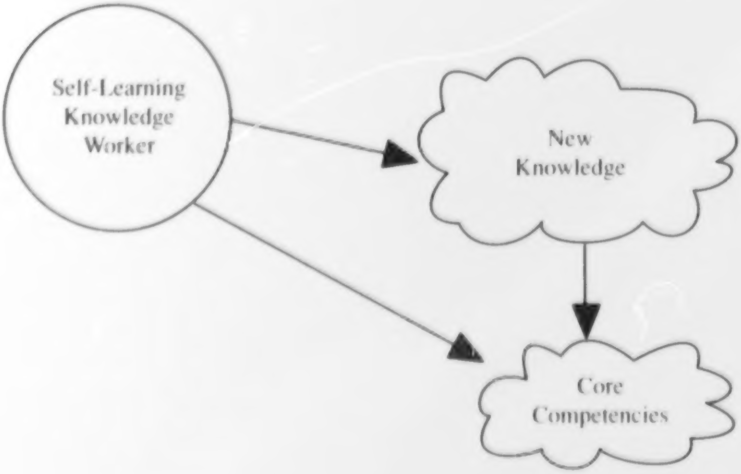


Figure 10 : Self-Learning Knowledge Worker

Self-Learning Competency - Emphasis on Depth and Breadth

Self-Learning Competency is fundamentally concerned with deep and broad learning rather than learning procedures and rules. In-depth knowledge and mastery of specific task and situations, gives an awareness of generic principles and processes which can be transferred to deal with other specific areas. James Joyce's rationale for focusing in depth on one day in the life of an individual in one city, in his masterpiece Ulysses was that: "If I can get to the heart of Dublin, I can get to the heart of every city in the world. In the particular is contained the universal."

In setting out to master the process principles which lay behind the rules and routines, a higher "meta-order" learning is achieved, which gives people more control when they are asked to learn new technologies and change work practices.

The opposite to this philos[illegible] is to learn only the "product" and the surface behaviours. Many p[illegible]kers argue for this option on the basis that it is quicker and more cost effective (Davies 1987). In the long term, and indeed even in the short to medium term for some occupations, this is likely to create a climate of resistance to change. This approach can give rise to "in-learnt - helplessness" (Swedish Work Environment Fund, 1988) "soldered-in-behaviours" (Bateson, 1972) and "learning blockages" (Downs 1987). The product type/surface learning has been termed "maintenance learning" which can be contrasted with "innovative learning" which is concerned with change and is similar to SLC type learning.

> "Maintenance learning is the acquisition of fixed outlooks, methods and rules for dealing with known and recurring situations. It enhances our problem-solving ability for problems that are given. It is the type of learning designed to maintain an existing system or an established way of life. Maintenance learning is, and will continue to be, indispensable to the functioning and stability of every society. But for long term survival, particularly in times of turbulence, change, or discontinuity, another type of learning is even more essential. It is the type of learning that can bring change, renewal, restructuring and problem reformulation - and which we have called "innovative learning" (Bennis and Nanus, 1985).

Self-Learning Competency - an active power

Many people see learning as something that **happens** to them mainly at the beginning of their lives. The teacher/instructor or manager/supervisor is seen as the critical actor. The learner is just a passive partner who cannot be trusted to take responsibility. This Behaviourist based psychology which has dominated vocational training in many countries, defines learning more or less as conditioning (Hilgard et al., 1975).

In describing "Self-Learning Competency" as an active power within people, the primary responsibility for learning is given to the learners. Learning is an activity which takes place in the learner. The psychology underlying this view of learning sees the person as someone who is self-organising with the locus of control within the person.

Self-Learning Competency - relates to all learning experiences

"Self-Learning Competency" equally applies to formal conventional learning situations and to informal learning experiences natural life experiences.

Competent Learners in traditional structured educational or training sessions, know how to observe what the trainer is demonstrating; they know what questions to ask and when; they are aware of their own individualistic learning patterns and know how to maximise their strengths and work on their weaknesses. In general they will approach their learning with an attitude of enquiry. They will also have developed learning skills suited to different tasks and content. (See Pearn and Downs in this volume and Downs, 1984).

In the natural everyday learning experiences, a "Self-Learning Competency" gives people the ability to gain insights and solve problems. Experience gives rises to a "knowing-in-doing" type of knowledge (Schon, 1983) which is stored consciously or unconsciously, to be used as an inner resource ("tacit knowledge") to deal with a variety of different problems. The habit of thinking on one's feet becomes ingrained, so that every situation is weighed up and general principles are applied in an appropriate manner.

Two Pillars of the Self-Learning Process

In a real sense it can be claimed that the learning problems presented by the introduction of new technology has prompted the rediscovery of the two classical principles about human learning. These are **human motivation** (starting up the learning process- why do I want to learn ?) and **self-awareness and control** (implementing the learning- how do I learn ?). These two pillars of "self-motivation" and "self-awareness and control" have to be in place before self-learning of any consequence takes place. (See Fig 11 - Two Pillars of Self-Learning)

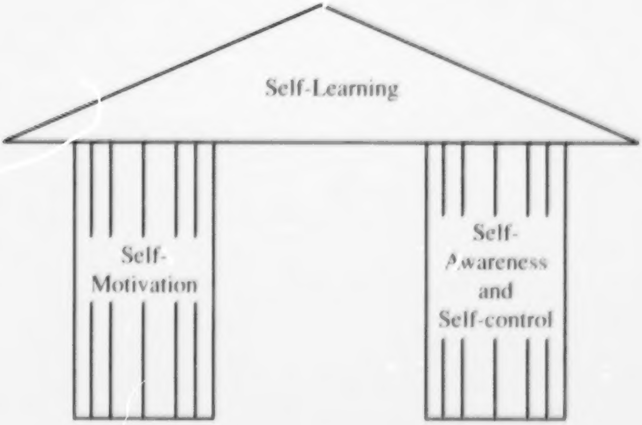


Figure 11 : Two Pillars of Self-Learning

Self-Motivation- Why should I learn ?

Self-learning presupposes the learners interest in learning. It starts therefore with a conscious wish to gain new knowledge, or to solve a problem. A clear conviction about the learning needs and/or a compelling goal or vision is the driving force. In many ways if this condition is fulfilled, the question of learning means/methodology does not matter so much - if there's a will, there's a way. Many of the company representatives who presented case studies at the Maastricht Conference made the point, that their successful learning projects were "problem driven" rather than "learning-technique driven" - the term learning (or training) does not even have to be mentioned.

The mechanistic (Tayloristic) philosophy of learning was based on the assumption that people did not really want to learn, so they had to be persuaded to learn through a variety of stick and carrot methods. Learning was seen as something which took place despite the learner, and no account was taken of developing the learner's spontaneous interest in learning. As a result, learning was seen by the learner as a contrived series of boring activities, which had to put up with for a few years at the beginning of one's life. Learning was also seen as split off from the natural problem solving activites of life, and something which took place under the control of others in a removed environment. Thus the late Bill Shankley, Manager of Liverpool Football Club, one of the most successful football managers in Europe, could say "I've never been good at education, I've always had to use my head"!

The first step in becoming a self-learner therefore is becoming aware of one's own learning power, and to a certain extent the simplicity of learning. The role of the training/development agency is to de-mystify the learning act, presenting it as a natural enquiring and development process, related to everyday activities. In the Training Institute context therefore the most critical phase of the learning process is the initial one, which has to be concerned with clarifying the reasons why participants want to be there, and what is it that they want to learn (learning goals), and how they are going to learn (learning action-plans). This discussion will involve the clarification of the role of the learner as a self-learner *responsible for his/her own learning*, and the role of the *trainer as assisting this self-learning process.* The drawing up of personally negotiated "learning contracts" between the learners, the trainer and the institute will put the right sort of pressure on the learner to take charge of the learning process in a responsible self-learning manner. (AnCO/FAS,1985)

In a Company context, learning must be seen and implemented as a means of solving problems which people feel belong to them, and which they can work out together with management and colleagues. This entails undertaking discussions in a relaxed environment where all aspects can be examined, including the responsibilities and benefits which relate to the company as well as to the individual.

Self-Awareness and Self-Control- How do I learn ?

Learning as it is described here in a self-learning context, results in a significant change and readjustment of one's perceptions, which takes place over a certain period of time. This requires internal and external alertness (Self-Awareness) and a high level of planning and a sense of commitment (Self-Control)

Procedural or rule-based learning is very often un-reflected learning. It just deals with internalising a skill or some knowledge in a passive way.

The result of this learning can be good or bad - a person could just as easily learn the "wrong way" as the "right way". This kind of learning can be referred to, for our purposes here, as "linear learning". It's the learning of a "one-track mind" (See Figure 12 - Linear Learning).

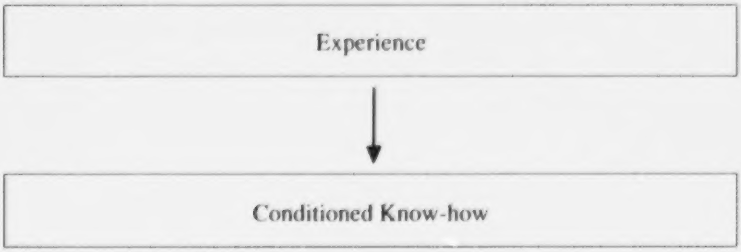


Figure 12: Linear Learning

The "learner" is trapped in a one way conditioning experience. Aldous Huxley once wrote that "experience is not what happens to a man; it is what a man does with what happens to him". Reflection is the means by which one takes control over what is happening to oneself. This means being able to give oneself feedback, "looking backwards to go forward" (Gofree, Stroomberg, 1989). This kind of learning which is an essential feature of self-learning can be termed "lateral learning". This means that the learners **step to one side**, away from the action cycle, to review their behaviour and so have a opportunity to change or exert new controls on the way they do things, and reinterpret their experiences. (See Figure 13 - Lateral Learning).

Self-Learning also involves a commitment to taking risks and staying with the task. All significant learning involves risks because learning involves change, which in turn creates uncertainty. It also involves planning the stages and strategies for one's learning, and being able to deal with frustrations and low ebbs when they arise. Learning also will only occur if people have got mechanisms for steering their learning. They will then be able to select appropriate learning resources or technologies, depending on the nature of the learning needs and their own learning styles.

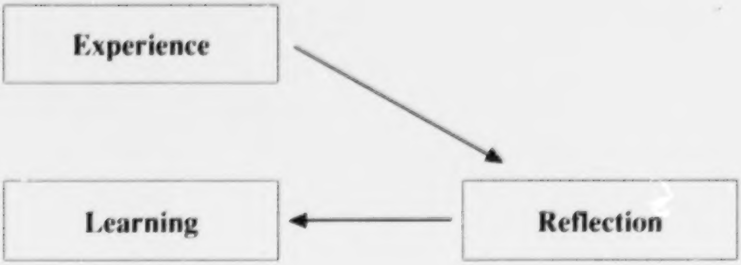


Figure 13 : Lateral learning

Chapter 5

Organisations for Self-Learning Training Institutes and Enterprises

One of the central points which became evident during the course of the Enquiry was the interdependent relationship between overall organisational design/culture/values and the degree and quality of learning. The question of **renewal of methodology, training strategies or curriculum cannot be divorced from organisational renewal**. (See Figure 14 - Relationship between Design of Organisation and Learning Effectiveness.) Radical rethinking is required on the design of organisations, be they training institutes or enterprises, if they are to foster the type of self-learners described in the last chapter.

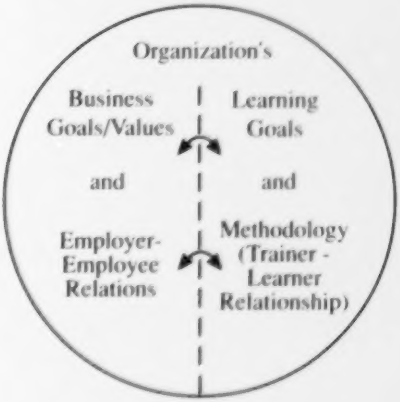

Organization's
Business Goals/Values
Learning Goals
and
and
Employer-Employee Relations
Methodology (Trainer - Learner Relationship)

Figure 14 : Relationship between Design of Organization and Learning Effectiveness.

A brief analysis of the image of *self-learning organisation* is outlined therefore at the beginning of this chapter before going on to a more detailed portrayal of the features of what is termed the *"total learning environment"* as it applies to the training institute and the enterprise.

Self-Learning Organisation

According to the open systems theory, an organisation can be compared to a living organism, which continuously maintains itself through the **internal self-organisation** of all its parts, while simultaneously interacting with, and responding to the **external** environment. As each of the parts/organs undergoes continual change, replacing cells and building up new structures, the overall system nevertheless maintains its structure. The parts are interlinked by an overall self-organising principle, so each semi-independent part works for the renewal of the whole system. If one of the parts ceases to function the whole system gets sick.

Learning is the means by which an organisation renews itself, so if there is not a central unifying **self organising learning principle** stimulating the learning of all the different parts,"sickness" will break out which will affect the whole organisation. This learning must take place through involving **all** staff in an integrated and appropriate way in the clarification of company goals (mission/values), in preparing for **external** changes (technology, markets), in dealing with the **internal** organisation of the different departments and interrelationships between them, and in responding to individual professional and career training needs. In this way the whole system made up of many parts can continuously transform itself. An organisation which implements this model can be called a "learning organisation". A learning organisation may be defined as one - "in which learning is not restricted to discrete 'chunks' of training activity, either fragmented or systematic, but is one where it has become a continuous process, and where on-the-job learning has become a way of life" (Barnham et al.,1988).

The kind of organisation which fosters and promotes the learning of all of its staff in the latter manner can, to use the SLC imagery, be said to have a **corporate self-learning competency**. Its management staff can lead the individuals, and groups working in the organisation, in integrated/systemic learning. If an organisation does not have a self-learning culture, self-learning activities will not take place except in a haphazard manner.

Because learning must become an integrated organisational issue it is not enough that a Training Department is set aside to look after the learning or the training **for** the organisation. The role of the training department is to support the organisation to learn. Senior Management must commit themselves to an active role in promoting learning which has a "Top Down" leadership movement, firmly backed up by "Bottom Up" learning activities.

The administration/management of Training Institutes must take a prominent leadership role in the introduction and implementation of an organisational learning environment. A new open learning relationship cannot be established between trainers and trainees, if the management style of the institute is authoritarian and bureaucratic. If a new methodological approach is to take hold it must reflect a new organisational culture. **Methodological change is an aspect of organisational change**. Managers of training institutes should see their main task as- 'making learning happen'. This means being training architects and designers rather than training administrators. They must initiate and nurture the growth of radical new systems of open and flexible systems of learning, which will enable learners to acquire the new competencies which are necessary in the future working place.

Total Learning Environment

It is important to point out that when participants described the features of the self-learning environment, during the Enquiry, they qualified their remarks by stating that they were describing models to aspire towards which at present are only partially operational. According to Talpaert (in this volume), it is imperative for Europe that this type of model is implemented fully and widely. The Japanese claim to have attained it within their own organisational design context (Matsushita, 1985).

Some of the many images and ideas, put forward by participants to describe the environment which fosters self-learning knowledge workers are outlined in Figure 15- Terms Relating to the "New" Learning Environment. Some of these are indeed new while others clearly refer to "old" concepts which have been rediscovered.

All of these terms point to a paradigm in which learning is brought out of its compartmentalized position in an Education/ Training Institutes or Company Training Department, and **integrated with every day events**. Learning is portrayed as a **natural activity** concerned with increasing understanding of work situations/problems and developing the competence to deal with them. Learning is also seen as a co-operative venture in which **experienced learners** (Trainers, Managers, "Older" Workers) and **less experienced learners** (Trainees, "Young" Workers) jointly participate.

Learning Company
Learning Oriented Work
(Self) Qualifying Organisation
Action-Field Learning
Shared Learning
Top-Down Learning

Figure 15 : Terms Relating to the "New" Learning Environment.

The concept of "Total Quality" has been used in recent times to stress the fact that "quality" is the responsibility of all the people in the company and not just the "Quality Control Department". In the same way the term "Total Learning" can be used to highlight the fact that **everybody** is responsible for learning. The new learning environment can therefore be described as a "Total Learning Environment" meaning there is **no set place or time for learning**, and no set one way - it takes place everywhere and at all times, using a variety of different methods and flexible delivery systems. This kind of environment can be contrasted with a "Partial Learning Environment" (See Fig 16 - Partial and Total Learning Environments Compared).

	Partial Learning Environment	**Total Learning Environment**
Place	Training Institute/ Department	Everywhere (Every situation is a learning opportunity.)
Time	Set Times (Particularly at the beginning of one's working life.)	All of the time (Every moment is a learning opportunity.)
Parti-cipants	Trainees/Students are Learners - receivers of knowledge. (Trainers are dispensers of knowkedge.) Company Manager sees learning as the responsibility of the Training Department.	Everyone is a learner - Trainers and Trainees (All are searching for new insights.) Company Manager promotes learning as a natural activity in all departments.
Content	Learning is concerned with specialised subjects/disciplines. (Technological and organisational competencies are learned separately.)	Learning is concerned with solving problems which arise/dealing with issues. (Learning is 'whole context based' so technological and organisational competences are dealt with together in relation to a context.
Metho-dology	People learn a set curriculum in a passive manner as competing individuals.	People learn in an open flexible manner, through interacting/cooperating with others, and on their own, to respond to group and individual needs.

Figure 16 : Partial and Total Learning Environments Compared.

Total Learning Environment in Training Institutes

If a total training environment is to be realised in training institutes the focus of attention must be on the overall, ever changing, **work context** rather than on the *subject matter oriented content*. A context driven curriculum focuses on all features of the job which people are being trained for, the business, technological and social/organisational ones. The "top-down approach" to training, put forward by some of the Danish participants is a way of implementing this idea. In this approach the training programme starts with a focus on the overall performance level which will be required at the very end of training, and only then goes on to deal with the different specialised skills and knowledge which come together to make up this overall performance level. During the life of the training programme there is a constant referral to the overview picture.

A Total Learning Environment also means that training must be **present day problem oriented** and not just learning about how to solve yesterday's problems. This requires a competency based training model based on the highest present day standards in Industry. A way to implement this training is to use projects as the key driving forces in the programme. Project based training is not a new idea. It is true that many of the disadvantages of training based on projects have been articulately expressed over the past years. One of these concerns the difficulties in individual assessment which cannot be carried out with the same degree of "objectivity" and administrative neatness as in a more traditional system. The sloppy implementation of, and indeed the abuse of the project based system, which some people assume to be an "easier" way of training has also done much to discredit it. Real financial problems also occur in relation to the provision of up-to-date equipment and materials, particularly in relation to the metal and electronic sectors. Notwithstanding some of these real problems and risks, the project method, or the "action-field method", as it is also referred to, has very strong arguments in its favour as being one of the only effective ways to enable people to acquire self-learning and other core competencies which are required in the workplace.

Another point about a Total Learning Environment in Training Institutes which is related to the two previous ones, is that if a technology programme is to enable trainees to effectively utilise their new skills, then it should not be technology centred ! It should rather be problem centred. Technology training is about learning to solve problems by using the appropriate technological tools. It is not a question of learning unfocused "pure" technology for its own sake. It has been pointed out for example that some people have spent many months learning to achieve a high level of proficiency in using data bases, but are unable to put this learning into practice in the company, because their learning was of text-book purist variety. They had never learned to address the untidy and real-life problems which one is likely to encounter in the workplace. Many employers have voiced criticisms about this issue, and have been forced to bring their highly qualified new recruits, (in terms of diplomas etc.) through an "unlearning" process so as they can acquire genuine reality oriented competencies.

The programmes in the Training Institutes must also move in an interdisciplinary direction. This means breaking down the barriers between for example, the different engineering, technical and business professions and also between "education" and "training". Self-Learning Competency for example in many people's minds is seen as coming under the "educational" sphere, and perhaps the humanities branch at that. In fact it is the broad based competencies which the modern technological businesses require in their workforce, if the technological investment is to fully exploited. As one bank official put it: "The bank can train anyone in becoming proficient in the use of specific techniques and procedures; the bank cannot train individual workers in thinking for themselves and in being at ease with broad and complex environments" (Bertrand and Noyelle,1988). It is paradoxical that such a statement about the value of a humanities oriented education should be made in a report about technological change in banks and insurance companies. Perhaps new technology is providing us with an opportunity to heal the split between "homo sapiens" and "homo artifex" which has bedevilled our civilisation !

The new regulations on vocational training of industrial metal workers, introduced by the Federal Republic of Germany in 1987, also lay great emphasis on the integrated learning of technological competencies and non technological ones such as: social competence for group behaviour; ability to co-operate and communicate; willingness to assume responsibility. Special attention is paid to increasing the workers willingness and ability to learn. Research undertaken by the German Federal Ministry for Research and Technology found that skilled workers' "tacit knowledge based on experience" cannot be replaced by new technology (See Martin 1988), consequently the emphasis on learning to be self-learners during initial training. The British Business and Technician Education Council is also implementing a curriculum in which non-technical skills ("common skills") are learnt alongside business or technical skills, with a project based methodology being favoured.

The importance of the initial phase of a learning programme in relation to the learners'self-motivation has been pointed out earlier. This issue is so critical that it deserves to be expanded on still further. If the trainee is to learn to become a self-learning person, then he/she must be challenged to take responsibility right **from the beginning of training**. If the programme starts in a traditional way it will be very difficult to change in mid-stream. A systematic Induction/Contracting period needs to be planned which will give the trainee an opportunity to adjust to a new way of learning. It is only when the trainee is ready, that a learning contract should be agreed, and the formal programme begin. This period enables individualised learning plans and strategies to be drawn up to suit individuals needs and learning styles.

The need for the trainer to take on a new role, has been highlighted as one of the critical elements in developing the new self-learning knowledge worker. Trainers must surrender their authoritarian/expert role, and take on a new more complex one. They must lead but not dominate. They must see some of their main tasks as enabling trainees to define learning goals, draw up plans to achieve them, and review progress. They must become **managers of learning activities**, rather than training delivery agents. This means seeing **trainees as active partners in learning**, rather that passive recipients of knowledge. This model of training has been adopted in the Irish "Skills Foundation Programme" (FAS/AnCO,1985), which was one of the projects participating in the Enquiry.

Total Learning Environment in the Company

In a company context a "Total Learning Environment" means that the company itself becomes the learning environment. Learning is seen as a **key element of the integrated strategic plan to achieve organisational and business goals**. The continuous self-learning ability and level of overall competence of the workforce, which go together to make up the total learning organisation, is recognised as the means to being able to undertake organisational and technological changes in order to meet business needs. (See Figure 17 - Total Learning Organisation: The Key to Change and Development.) The high powered new technology cannot be harnessed without an equally high level of competence and learning power in the skilled workers in the company.

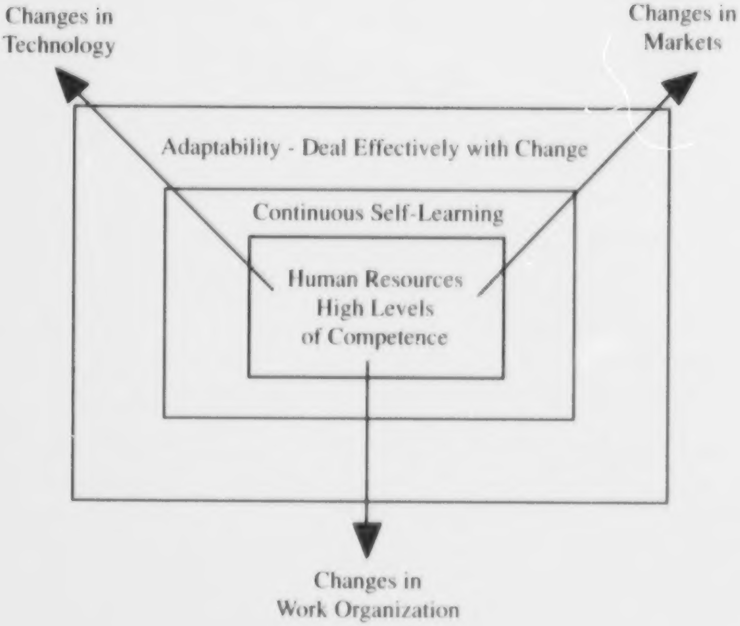

Changes in Technology
Changes in Markets
Adaptability - Deal Effectively with Change
Continuous Self-Learning
Human Resources High Levels of Competence
Changes in Work Organization

Figure 17 : Total Learning Organization : The Key to Dealing with Change and Development

A large Development Programme within companies undertaken by the Swedish Social Partners from 1982 to 1987, was based on the idea that investment in human resources is a major prerequisite in the smooth and productive introduction of new technologies:

> "It has always been realised that the efficiency of an organization can vary, depending on how it is organized. It is equally obvious that education and competence are factors influencing people's willingness and ability to perceive and participate in the transformation of an organization. Integrated renewal of the organization and competence are therefore crucial, especially in a period of rapid change for both business and public administration. This can in fact be the most critical question affecting the ongoing development of the modern industrial enterprise in a dynamic international market.
>
> Technology can often be purchased or copied. New techniques rapidly become available to competitors. Competitive strengths

> hinge instead *on the use which people make of technology*. Knowledge and the willingness and ability to utilize and renew it are not readily copied" (Swedish Work Environment Fund, 1988).

The workplace itself became an "action-learning" system" in which people gained new skills by means of the "natural learning process", through analysing and solving problems. Ordinary industrial workers were trained to be software workers. These employees were seen as having "tremendous potential" as distinct from the sterotyped image of being "ignorant, incompetent zombies" (Swedish Work Environment Fund, 1988).

To create this kind of environment requires the articulation of a **new vision** of learning as a strategic issue essential to a company's growth. At the Maastricht Conference the point was made forcefully that managers and policy makers must give the lead in pointing out the link between organisational, business, technological and learning objectives, and act as leaders in designing and implementing organisations which will take this model on board.

This new learning environment, which facilitates self-learning activities to take place operates in the context of an overall new model of the company which can be called a "Commitment Focused Organisational Model", as distinct from a "Control Focused Model". (See Figure 18 - "Commitment" Focused Organisational Model). The commitment model works on the assumption that by promoting responsibility, individual and team autonomy, higher levels of company commitment will ensue, which in turn will mean higher levels of overall performance.

Organisations cannot take on the above features overnight. Careful planning at a macro and micro level must take place over a period of time, if these changes are to be more than mere cosmetic ones. Change has to take place at a pace which everybody can keep up with. The starting point itself has to be carefully selected. This process can in fact begin with a learning/training programme which is formulated in terms of tackling a problem which all of the people involved want to tackle. This problem for example could relate to the adoption of a new technological system. Learning programmes work better paradoxically when they are formulated in terms of *resolving a problem*, or *dealing with change* rather than in terms of "a formal learning programme". Learning is more effective when it is "problem driven" rather than "methodologically" driven. This kind of learning is referred to as a **focused** approach , and is contrasted with a **fragmented** (chaotic on the job learning), and **formal** (traditional passive classroom based) learning (Barnham et al., 1988). In the focused approach the emphasis is on "planned on the job learning" with a major role for line management working as trainers/mentors in the joint formulation of the problem and the implementation of activities to resolve it.

Flexibility in Duties Undertaken by the Workforce ;
Flat Organisation Structure;
High Level of Training and Retraining for Existing Workforce;
Employee Participation in a Wide Range of Issues;
Employment Guarantees (e.g. about no job losses);
Reciprocity in Labour Relations (i.e. joint planning and problem solving);
Management Philosophy which supports Multiple Stake-holders e.g. owners, employees, customers and public.

Figure 18: Commitment Focused Organisational Model (Walton, 1985).

Chapter 6

Taking Steps Towards a European Self-Learning Community

Pierre Caspar

"Des Cerveaux de l'An 3000 pour les Têtes de l'an 2000".
(30th Century Brains needed for 20th Century Heads)

The above phrase appeared as part of a job advertisement some time ago in a French newspaper. It illustrates very well the present focus on **intelligence** in all its forms. This fascination with intelligence is particularly noticeable in the Europe of to-day, which is searching for an understanding of itself in a context of accelerated change, rising complexity, and in a world characterised by interdependence and competition.

The above phrase appeared as part of a job advertisement some time ago in a French newspaper. It illustrates very well the present focus on **intelligence** in all its forms. This fascination with intelligence, is particularly noticeable in the Europe of to-day, which is searching for an understanding of itself in a context of accelerated change, rising complexity, and in a world characterised by interdependence and competition.

The growth of interest in the topic of intelligence is due to two factors. On the one hand, we have a steadily increasing investment in developing the "intelligence" of machines, in design, production, communication and marketing processes, evidenced by the considerable advances in the industrial world during the last decade. On the other hand, the growing mobilisation of intelligence in social processes, can be seen, for example, in the demands made on companies, who have to simultaneously plan their technical investments, their managerial and organisational structures and the development of their human resources. It can be seen more generally in the innovative approaches to social structures, which are no longer considered as institutionalised forms, but rather as the expression of choices made by a society faced with problems to be resolved, challenges to be met, and a future to be realised.

This emphasis on human intelligence is not devoid of risk. It may, for example, originate from a **narrow vision of intelligence** concerned only with the intellectual aspect of things. It may also lead to the development of dual societies, which are even more perverse, since those excluded, in ever increasing numbers, attribute the cause of their rejection to their own shortcomings. At the same time, this type of new social and economic encounter can lead to a greater recognition of the men and women of our times, as an essential resource, and as true actors in the theatre of the world. This extraordinary advance can be termed the **"revolution of intelligence".**

Education and Training are at the heart of this reflection because they lie at the crossroads between **the individual,** the development of the person's competencies and knowledge, and **the collective**, the implementation of a cooperative project in society, on both a European and a world scale. It is not just by chance that there is so much debate about training at the end of this century, and that so much money is being spent on both basic and adult education. The reason for this is that both knowledge and competence are seen as more strategic, and at the same time are tending to become obsolescent at a quicker rate than ever before in human history. It is in this context that the issue of building people's self-learning competencies is so crucial for Europe.

The ethnologist Margaret Mead predicted as early as 1954 that we would be changing careers several times in the course of a lifetime. This could not have been more true. Even in the course of a single career we need to be open to change, so great is the demand to continually renew knowledge, know-how, attitudes, and ways of communicating, in our perpetual quest for stability, mastery and meaning. Indeed, more and more demands are being made on today's business and administrative employees. They are expected to be competent in their jobs and to master the necessary techniques, but a great number of complementary skills are asked of them as well. They have to know how to communicate, how to think in terms of total quality, how to internalise the client's wishes, how to express themselves and how to obey, how to lead and inspire teams, how to work on projects, how to participate in progress groups, how to take risks as well as guarantee results, how to work faultlessly, without notes, without preconceived ideas, without mishap, weakness and delay.

They are expected to be knights in shining armour, totally involved, yet beyond fear and reproach. In a word, lifetime winners! What possibilities for development, but also what anguish!

The traditional educational approaches in Adult Training (a group, a room, a trainer and a pile of papers) are subject to a two-fold limitation. On the one hand, a financial limitation - for there is no way to satisfy growing training needs by proportional increases in costs and number of trainers. On the other hand, there is a pedagogical limitation - for the acquisition of the necessary qualities is the outcome of complex educational processes, the classic training course being but one element among others. The ancient classical ideas about learning and pedagogy however are proving to be more useful than ever to-day. They make us consider the coherence which must exist, the relationship which must be established between training processes and problem resolution, in the context of technical, economic and social change

This is the context within which EUROTECNET has considered the question of self-learning in terms of both work situations and of methodology. We have looked at self-learning in two ways: in terms of an individual engaged primarily in a self-guided educational process; and in terms of a group working with autonomous learning abilities to produce results which have broader implications than learning as it is traditionally understood. In the latter case therefore perhaps the term self-training may be more pertinent than self-learning, because by definition learning is a personal activity.

The Meaning of Self-Learning

There is evidently much more to self-learning than the desire to economise and to acquire prescribed knowledge and know-how. To engage in a process of self-learning is also to become acquainted with one's own rhythms and to conduct one's learning accordingly. It is to discover one's own motives and fears of change; to learn to recognise what one knows and does not know; to take a critical stance regarding expertise; to learn to solve problems which are still unknown - in short, **to engage in self-learning is to awaken in oneself the capacities for self-sufficiency** and responsibility which are required in all life situations in democratic countries.

We are witnessing the spectacular development of highly individualised training programmes which may, (or may not), make use of sophisticated technology, which engage in action research and experiments aimed at transforming work situations and even businesses into educational enterprises as well. The stakes are sizeable, and beyond the scope of trainers alone, because a learning/education oriented enterprise is a place where the work situation itself becomes a permanent source of development; a place where daily events can be educational experiences. It is also a place where job mobility is thought of in this spirit, and where evaluation meetings result in training plans. In the midst of work, all the comings and goings are valued, including research, which produces knowledge, training, which shares it, and the work activity itself which makes all of the learning worthwhile. Self-learning, planned and managed in an enterprise in this spirit, comes about because of an agreement among the people involved.

The development of self-learning situations and possibilities is fascinating. It is also highly important for the development of a continuous self-learning workforce in Europe. The manner in which people from different backgrounds have collaborated in studying the issue in this EUROTECNET venture, is proof of this. Since it is such a central topic it is useful to look again in a focused and summary fashion, at the prerequisites which will allow people to learn as part of their everyday life experiences. Self-learning first of all implies that learning is possible, secondly that continuous self-learning makes sense to people, and thirdly that learning has a definite purpose. I wish to deal with these three ideas.

Learning must be possible

This presumes that a person can learn effectively, and that no major psycho-motor, cognitive or effective blocks are in the way. Furthermore it must be assumed that access to programmes, to resource centres, and learning materials exists. Considerations of finance, transport and equipment must also be in order. It should also be possible to complete the learning, whatever hazards of comprehension, motivation, or of inter-personal relations one encounters. It is here that we come back to the extreme importance of the trainer in the context of a new division of roles, a new positioning of learners and trainers.

Even when learning on one's own, the presence of a trainer is needed in a special way through the teaching aids and supports which he/she has to provide. To learn on one's own is in a way like writing a book, with **oneself as the hero** but with a plot woven by others - at least in the beginning. The **trainer can be seen as a partner** in all the key moments along the way: initial stages, identification of stumbling blocks, seeking appropriate solutions. It can thus be seen how a global vision of the territory to be covered, presented to the learner right from the beginning, can be decisive in terms of economy of effort and transfer of learning to the work situation. This trainer in the self-learning process is, as it were, the link between supply and demand. This also implies that training takes on its full meaning only when there is a desire to be trained.

This approach however places the trainer in a completely different position in relation to the "comforts" of the traditional disciplinary approach. Certain European countries, certain cultures, are more prepared for self-learning than others, for they have learned at an early stage to base their reasoning on concrete problems to be solved, rather than on the truths of abstract science. The possibility for self-learning depends on teachers and trainers being able to widen the scope of their traditional responsibilities, to take more risks since they are working not only in the field of pedagogy but also dealing with the broader "organisational" aspects of training, and relating with trainees in the "personal life" as well as the "worklife" spheres.

Self-learning and continuous self-learning must make sense to the people involved

To be a self learner means to **continuously transform oneself.** Learning is an activity which directly affects one's self-image, and the development of one's individual and social identity. All learning takes place within a specific social and historical context. Anything affecting the sense of identity will thus have a direct influence on one's motivations, perseverance and the meaningfulness of learning. I am thinking of the identification with parents and teachers, or rejection of them; of a self-image formed and internalised by early academic successes, or failures; of the status given to learning within one's social class/professional milieu, and of the possibility of making educational choices in a more open context. All these factors explain why training/education may be rejected because of a hidden subjective reason which does not make sense when examined objectively.

This analysis relates to three different influencing factors:

- The first of these is the ***school system and initial education.*** It is here that a learning ability and the love of learning will or will not have been fostered. Knowledge is acquired because of a desire to know, and an investment in learning must be seen as an investment in oneself.
- The second influence lies with the ***trainers.*** Do they know how to set up training systems which take into account and value the trainees' previous knowledge? Are they able to understand the individual and collective reasons behind acceptance or rejection of training schemes, in particular do they act as producers, dictating what must be known, or as stimulators, open to other people and to the world, like the Greek philosopher who once said, "I don't teach, I awaken."
- Finally, the third factor refers to the ***social, cultural and professional structures***, and the people in charge of them. Setting up a training project implies the establishment of a personal project, sometimes in a difficult if not antagonistic environment. The distinction between

"personnel administration" and "human resources development", illustrates the different nuances of company strategy. B. Schwartz, for example, has shown that qualifications in themselves are quite relative, and that the work situation largely determines the kind of competencies required.

Learning must serve a purpose

The discovery of new worlds is uplifting. Exploring a Roman basilica means more than visiting an ancient building. If one wishes training to bear fruit however one must aim at concrete as distinct from purely romantic goals.

Successful training is the result of a pedagogic and professional act which is planned by the trainer well in advance. It involves taking organisational and management issues into account. This also involves a degree of risk, because one is encroaching on people's lives.

Recent studies suggest that less than 50% of people do not use what they have learned one year after completing their training. The successful application of learning depends on a combination of many conditions being fulfilled. First of all, the act of learning must be recognised in one's milieu as a worthwhile activity. This presupposes that one is able to capitalise on what one has learned, and that there is an official recognition of what has been learned. This further implies that the organisation of work, the definition of professional responsibilities and career development, fit into an overall picture in which continuous learning is a central feature. Finally, a synchronization between managerial and educational decisions is presupposed. This means that the enterprise views training as a real investment which enables it to change and develop.

European Cooperative Projects

This paper obviously poses more questions than it can hope to answer. It is a good example of the methodology used in this European study of Self-Learning Competency. In international research, European Community Programmes such as EUROTECNET and organisations such as "The European Centre for Work and Society" play a pivotal role. The exchanges which these make possible, demonstrate the extent to which neighbouring countries have set up training systems based on very different cultures and philosophies of knowledge. Depending on the country, the term "training professional" has very different meanings.

These initiatives however provide opportunities for us to meet each other in an atmosphere of frankness, and enable us to **forge links** which facilitate mutual consultation. They constitute a sort of technological leading edge, allowing the **validation of innovations,** the creation of new tools, and most importantly the establishment of transnational projects. This is a critical point. In effect, we will all be increasingly challenged in the years ahead to engage in common projects with other European partners.

The first series of large-scale European Community programmes, has opened ways previously unexplored, the exceptions being multinational enterprises and institutes of higher learning. This new trend can only grow. The reason for this in the first place, is that the very nature of the problem, the design of effective training, is internationalising. Businesses feel it to be necessary to equip themselves with the latest competencies. The now imminent Single European Market, the free circulation of people, the establishment of a Social Europe, the development of business and academic exchanges, all increasingly encourage us to implement joint training projects, and to do so with a concern both for authentic partnerships and for the expression of the specific traits which make up each partner's particular genius. Such partnerships simultaneously lead to mutual enrichment, to a more economical use of time and resources, to a greater understanding of profitable and innovative realities, as long as there is a true commitment to mutual recognition and understanding. Those of us who have already had the opportunity to work in an international context know the richness which shared differences can bring.

Keys To Cooperation

The success of these transitional projects however depends on our ability to deal with the "how" questions as well as the ones dealing with the "why". We must take certain considerations into account to ensure success:

- First of all, it is necessary to have precise **information** and at least some **understanding** of training set-ups in other countries, their modes of operation and the political, economic and cultural institutions in which they are based. The publications of CEDEFOP, for example, illustrate how the same type of training problem can be approached in very diverse ways in different countries and still be resolved! It is striking to see the extent to which many French businesses, the medium and small scale ones in particular, still lack basic information on these different approaches, the results which have been achieved, and the Community Structures which could help them to be truly open within a European perspective. Information is therefore an essential prerequisite for making a decision about the area in which to concentrate, to identify the appropriate Community Programme and a suitable type of partnership, and to avoid a duplication of effort.

- For this purpose it is necessary to call on the services of an "**interfacing agency**". Community organisations themselves can play this role, as can their technical assistance units such as IFAPLAN, European Centre for Work and Society and CREW. This interfacing function can also be fulfilled by national agencies, such as, the COMETT information centre and the RACINE networking agency in France. Beside providing greater access to information about potential partners and the opening of preliminary contacts, these mediators can play a key role in two other respects: firstly in the identification and promotion of innovative ideas, facilitating the passage of dreams or futuristic utopias into concrete realities; and secondly in providing an initial financial impetus, without which many of the present achievements would not have been realised.

- A third condition necessary to ensure successful European cooperative projects has to do with **mutual understanding.** Much emphasis has been placed on linguistic difficulties, which are particularly troublesome for the French. This fact notwithstanding, the greatest difficulty lies in understanding the **context underlying the foundation and structure of different languages, cultures, economic policies,** ways of approaching and solving problems, and also patterns of citizenship, the social organisation of work, and legal systems. All of these give rise to very different approaches to training. These elements which present communication problems even when speaking the same language, have to be understood in depth if they are to be the starting points for sharing the richness found in the different national projects.

- Finally, the provision of community assistance, which is by definition limited, brings us to the fourth key factor to ensure the success of European projects, which is **capitalising on what has been achieved.** This means that benefits must accrue to all countries and that a real diffusion of information to universities, sectional branches, regions, professional organisations takes place. Too often joint projects financed by the Community only benefit the partners involved. This is not a result of bad will, nor a concern for secrecy, but simply because on many occasions the joint projects do not realise that the results of their endeavours could be useful to a wider audience.

The EUROTECNET venture on Self-Learning which we have considered here, has followed the above guide-lines. It has enabled us to see our discoveries in a wider European context, and perhaps given us a clearer idea about what innovation really is. In so doing we have contributed, in our modest way, to the development of the "Intelligence of Europe".

PART II

Issues Surrounding the New Learning Paradigm

Section Three

Methodological Issues

Chapter 7

The Self-Learning Gamble : An Examination of the Issues Involved.

Philippe Carré

1. The Emergence of Self-Learning: a Dual Origin

Individualisation, autonomous learning, action learning - these terms indicate a move towards self-learning which has been taking place for many years. The emergence of the notion is due to two factors, on the one hand the progress in **educational technology** and on the other hand **changes in pedagogical thinking**.

Apart from educational computer applications, (be they programmed instructions or simulations), the entire range of didactic tools is undergoing great upheaval. Pedagogical publishing and education oriented telematics, are experiencing an expansion towards the development of individualised educational resources and products.

It must be acknowledged however, that no matter how good these resources are, they cannot transform the learning process, which ultimately depends on the individual's awareness and commitment (**his/her reasons for acting**) or, to use a word which is seen to be old fashioned, his/her **motivation**. To be effective the new educational technologies must be integrated with a **sound educational framework** which gives it meaning. One cannot evaluate educational media without a parallel review of the basic conceptions of learning. An educational tool which lacks a sound pedagogical dimension is, whatever its degree of sophistication, as useful as a car without a driver.

2. Moving away from the Training Course Concept

Self-learning above all else means a change in thinking, "a new educational paradigm", a new ordering of educational relationships. This means that **the learner is responsible for the learning process**, which according to Dumazedier (1978), is the consequence of the birth of a truly educative society. Once the individual is involved in an educational venture, he must succeed in mastering it, in adapting it, in becoming the **"producer"** of his knowledge. We are now a world away from training, which is organised into preconceived, standardised, collective and repetitive courses. Although the development of a self-learning programme is compatible with the collective training concept, the fact remains that enrolment on a training course often limits the learning activity to a mere physical presence, which can become merely an act of absorption. The change in meaning implicit in the self-learning notion has to do with the transformation of "learning as consuming" into "learning as production and action".

Moving away from the training concept opens new avenues for learning as it undermines the temporal, spatial, legal and financial shackles of classical training. As Possoz (1985) observes, it means the creation of "**an educational medium, which is capable of providing a flexible and coherent response to the integrated and multi-faceted demands of learning**". This medium requires highly effective technical resources, but the pedestal on which the self-learning system is erected, is the new learner-trainer-content relationship, whereby the individual involved in the learning process, takes it in hand, employees body and soul in its implementation, and assumes ultimate responsibility for its realisation.

Self-learning is therefore not simply a new mechanism for the subjugation and robotisation of man, nor is it simply a modernisation of ancient methods of individualised education, as observed by Pineau (1978).

Neither is it a question of furthering the fortunes of "self-teaching", which has to do with compensating for the deficiencies of a selective educational system. Self-learning also does not thrust the individual into solitary learning which is akin to the environment of an educational desert. On the contrary it demands much more of trainers, of businesses and of learners, who take central and interdependent roles in the facilitation of learning.

3. The Seven Pillars of Self-Learning

The "training course" concept (a set place, time, and a trainer), is making way for a "self-learning" notion which fits in with seven fundamental conditions or pillars. These are outlined below :

3.1. A Project-Oriented Pedagogy

We agree along with Ardino (1987), that pedagogy cannot exist without projects. However, self-learning by its very nature implies that the learner's intentions and motivations are totally taken into account. The exact clarification of the nature of the learner's objectives, constraints, investment, commitment of time and energy, together with the negotiation of these issues with the training institute, represent the initial stages of self-learning. This project approach, which is again gaining in popularity, refers us back to former writings, Sartre within the field of philosophy, Nuttin in psychology and Dumazedier in the educational domain. The latter, who would undoubtedly rally to this idea of "a free will pedagogy" which stresses that the individual possesses freedom of choice, and is capable of assuming responsibility for the consequences of his actions. Tough, whose ideas are outlined here has spent his career supporting the principle that freely structured projects fit in with man's evolution and education. The fundamental maxim of self-learning is: **the trainee is, or can become autonomous and responsible for his learning project.**

3.2. A Threefold Training Contract

A self-learning project should be formalised along the following lines. A **contractual arrangement** ought to be made between the three protagonists (the learner, the trainer/educator and the institution), which will determine the broad outline of the project.

The following should be outlined :

- **objectives** and the terms of reference for evaluation;
- a **work schedule** (time management)
- methods for **evaluation**, validation, and certification of achievement.

This self-learning contract is very important: it is the point of common reference for all parties involved in the process.

3.3. A Mechanism for Induction and Pre-Training

Because the trainee is "on his own" in the initial stages of the self-learning process, difficulties are likely to arise. The learner can at times be disorientated and fear educational isolation. This could cause him to withdraw from the whole learning process. All authors in the field therefore stress the importance of a suitable induction. This should provide a explanation of the self-learning principles. In some cases this induction can take the form of a psychological and methodological preparation which has been described as "unlearning", and a "heightening of awareness" about the self-learning model which replaces the "consumption" model of education.

3.4. A Resource Centre with Free Access

"The institution itself [illegible]able of "creating" the self-learning process. At the very most it can only assist adults to work towards this", claim Bonvealot and Courtois (1985). The task of the institution therefore is to provide the human and material means which facilitate the autonomous actions of the learner. Among these is the resource centre, where the basic documentation with which the learner will work is compiled, classified and available. National Education Study Centres, and some public and private audio-visual libraries, and business training centres are organised in this way to enable easy and immediate access to the necessary learning tools.

3.5. Guides for Self-Learning

One of the great advantages of self-learning is that it allows the learner to manage his time in the way he sees fit. He will therefore, according to the situation, be able to study at his place of work, at a resource centre or at home. In order to do this, it is imperative that the tools and the study documentation at his disposal are in a compact and easily transportable form. The creation of self-learning guides must take these factors into account.

A series of slim manuals - we must not frighten the candidate off by obliging him to negotiate ten kilos worth of pedagogical baggage - should be compiled, based on the training programme tempo, and containing monthly and weekly pieces of work to be completed.

3.6. New roles for the trainers

A paradoxical aspect of self-learning is that, in giving responsibility to the learner, it also implies an increase in the training and supervision activities of the trainer. The trainer-teacher "showman" or group supervisor is replaced by the "resource-person", invested with the threefold mission of:

- facilitating learning by providing advice, direction, psychological and methodological continuity and a means of control;
- producing tools and managing the educational resources of the resource centre;
- monitoring and evaluating progress.

Without going to the extremes of the "ignorant master" described by Ranciere (1987), the self-learning adviser renounces the elitist position of the expert. His role relates to the learning process as opposed to the content of the training programme.

3.7. A Continuous Three Level Mechanism

The main risk involved in self-learning, the learner's feeling of isolation, can be compensated for by increased follow-up at the level of:

- the individual, through regular meetings between learner and trainer;
- the group, through timely meetings between individuals committed to similar projects;
- the institution, through the creation of a pilot group within which trainers, learners and the institution are represented.

4. The Necessity for Reinforcement

It is tempting to add an eight point to this list, because it refers to a dimension which is an essential part of any educational activity, despite the fact that it is often disregarded as being "self explanatory" - we refer to motivation building methods.

Self-learning is at times an extremely difficult experience and always a demanding one. Whereas it is possible to take part in a classical training programme simply by being physically present at the sessions, entry into self-learning demands complete commitment, which affects both professional and private life. Self-learning is a road strewn with many pitfalls. It is essential therefore, that the achievement of objectives should lead to some form of reward system (economic or symbolic) in the form of certification or promotion. This reinforcement will aid initial motivation and in certain cases overcome despondency.

5. The Main Directions of Research

The "pillars" of self-learning referred to above, cause questions to be raised about the validity of present research in relation to the organisation of training and education. We suggest seven headings for analysis of the practical applications of self-learning.

5.1. Self-learning and learner autonomy:

Over and above the "pedagogical act of faith", to what extent do the mechanisms and methods of self-learning promote the learner's progression towards autonomy? Which functional indicators can be used to determine the degree of autonomy to be given to the learner?

5.2. Self-learning and the training project:

What is the relationship between the individual training project and self-learning? Does the adoption of the project necessarily lead to self-learning? Is the formulation of a project the essential prerequisite for a commitment to self-learning?

5.3. Self-learning and the pedagogical contract:

Does the pedagogical contract promote the progression towards self-learning. Can self-learning exist in the absence of a contract in the business world?

5.4. Pre-learning and self-learning:

Can one prepare oneself for self-learning? How can self-learning be promoted among poorly qualified individuals, for whom progression is particularly difficult?

5.5. Self-learning, work time and free time :

What is the relationship between the time-budget and the self-learning projects? To which sphere(s) of everyday life is self-learning applicable? How can time spent on self-learning outside of working time be credited?

5.6. The new role of the trainer:

To what extent do the consequences of self-learning demand specific skills of the trainer? What are the different functions within a self-learning system?

5.7. The self-learning methods and resources:

What kinds of resources are referred to mostly in research concerning the practical applications of self-learning? To what extent does the development of new educational technology promote the progression towards self-learning? Does the generalised access to various self-learning resources promote a consumption/purchase type of attitude which lacks continuity within learning situations?

6. The Self-Learning Stakes within Vocational Training in France

6.1. Within professional life:

The concern here is to demonstrate how self-learning can respond to the necessary development of autonomous behaviour(s), not only within training programmes but also in the execution of professional responsibilities. We have seen that the business world cannot "create" self-learning on its own; it is after all the learner who commits himself to this step. The relevance of self-learning is to be found within the context of **everyday learning** and the merging of work and training, which dilutes boundaries and brings about an attitude of permanent learning. Finally, self-learning may be presented in the light of the co-investment training notion, which has been the object of a study carried out by INTERFACE at the request of DFP in France, in 1988 (Carré and Videl).

6.2. Within society :

The necessity to increase the capacity of all forms of continuous training, about which there is a consensus, makes it necessary to consider training resources being made available outside the place of work, within the proximity of everyday locations. The business world cannot in fact respond to all the professional training needs of individuals. To what extent can the available resources (libraries, audio-visual libraries, telematic programmes, radio and television etc.) respond to a self-learning development movement within society, which would be complementary to the efforts of the business world to improve the capabilities of its employees?

6.3. Self-learning and permanent development:

The fact that adult training encompasses both an attempt at technical improvement (related to business development strategies, which are by their nature specific) and general training (cultural and professional, more related to the individual's personal development), to what extent does the orientation towards self-learning contribute to the rapid development of an "educative society" which, according to Dumazedier (1978), promotes a longing for knowledge at each of life's stages? To what extent does self-learning contribute to a better understanding of the motivational force of the **individual's willingness to learn and to change**, which in turn makes an impact not only on the organisation of work but also on the contemporary global economy and on social relationships?

7. The Self-Learning Process and the "New Qualifications"

The definitive goal of self-learning is to substitute the "learner-actor" for the "trainee-consumer". This orientation seems to corroborate all present thinking on the **"new qualifications"** demanded by businesses with an eye on the XXIst century: these are: autonomy within the organisation of work, increased responsibility at all levels, flexibility and adaptability of skills, and a permanent improvement attitude.

As the "course-type" methods divide up time and space, and break up knowledge and tasks into compartmentalised units, it is to be feared that this type of pedagogical organisation does not promote the objectives of autonomy, adaptability and continued improvement. Self-learning, as we have seen, aims precisely at developing those skills necessary for businesses to survive in a continuously evolving economic world.

Autonomy acquired through learning may, one can argue, be transferable to the execution of work. The habit of continuing improvement, awakened within the individual by the basic principles of self-learning, will enable him to apply the research and permanent learning techniques to his professional field. The promise which self-learning brings to companies, transforming them into educational forma, undoubtedly justifies the self-learning gamble!

Chapter 8

Self-Learning Competency : Approaches and Experiences in the Federal Republic of Germany

Wilhelm H. Bähr

1. Introduction

This text provides an overview of approaches and experiences related to the development and moulding of Self-Learning Competency. The term "Self-Learning Competency" which stems from EUROTECNET, (Nyhan,1989), and is the central topic of this paper is not commonly used in the German language, therefore I would like to provide an interpretation of it by using a matrix. This matrix may convey more properly the concept of "Self-Learning Competency" than a linguistic definition, and also help to define the field of interest covered by this contribution.

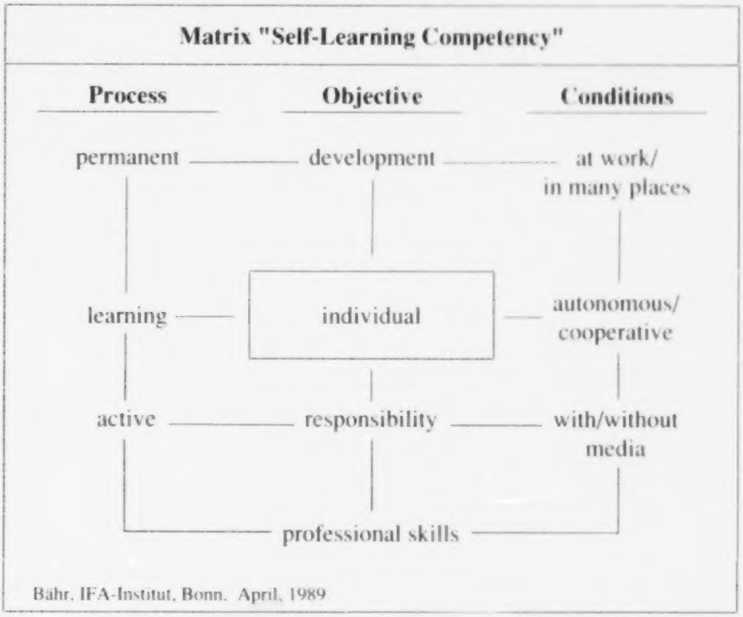
There are many ways to promote a learning competency in workers.

- Some aim to do so by changing pedagogical methods. The Mannesmann Demag firm in Duisberg for example has intensively debated the question concerning which training methods are most likely to develop certain **"key" qualifications,** in particular, a self-learning competency.

- Individual industry-oriented training centres network their training arrangements in a CIM-concept, thereby allowing trainees - particularly qualified employees - to experience **work and learning in integrated production enterprises**. The CIM-oriented training factory in Villingen-Schwenningen is an example of this concept.

- With regard to autonomous learning, (although not in the actual sense of a learning competency), numerous **computer-controlled learning systems** exist. Learning software for numerically-controlled machine tools is widely used. Whilst retaining its effectiveness as a learning tool, this software has also been developed into a professional product which is usable as production software.

- A large number of **correspondence courses** offer programmes in the field of new technologies. Experimental methods and equipment which facilitate autonomous learning on the part of the student, complement the printed course material. One example is the "Electronics" correspondence course offered by DAG-Technikums in Essen, which was developed as a pilot project sponsored by the Bundesministerium für Bildung und Wissenschaft.
- Furthermore, there are numerous approaches in the field of **"cooperative self-qualification"**. These are characterized by "the cooperation of people, with varied specialized skills who by group association (projects, planning sessions, on-the-job learning, quality circles, etc.), learn/teach one another through the solving of problems and are thereby able to handle existing and arising conflicts". (Heidack, 1989). A recent example of this is the pilot project in Paderborn, in which trainers, with the aid of the conference method, aim to continuously self-qualify themselves. In this project trainers themselves develop a self-learning competency which they also promote among the trainees entrusted to them.



Bähr, IFA-Institut, Bonn. April, 1989

Figure 1: "Self-Learning Competency"

A complete overview of the approaches and experiences of Self-Learning Competency in the Federal Republic of Germany is not possible within the framework of this paper. As the responsibility for vocational training lies predominantly with industry, numerous paths are being followed to develop learning skills, and I have chosen three sectors which will provide an insight into the situation in the FRG.

To begin with, I will deal with a new approach being developed and tested in a pilot project by the Kreishandwerkerschaft Paderborn. This project is sponsored by the Bundesministerium für Bildung und Wissenschaft and the Bundesinstitut für Berufsbildung. It shows amongst other things, the new paths that are being taken. Central to the project is the attempt to make the **actual operational processes of enterprises** an instrument for initial and further training. This should make it possible to discard the traditional approach of systematising courses according to subject matter. Learning about the actual functions of the workplace in their entirety is put in its place. In this way the learning approach corresponds exactly to the structure of a **learning-oriented work** concept.

Subsequently, I will try to present an insight into the development of **project-oriented learning**. Steam engines, tools, turbines, and even robots are produced by trainees on the basis of the instructions provided.

Increasingly, projects take the form of physical tasks similar to those carried out by means of technical equipment, for example:

- insert the workpiece
- fasten the workpiece
- make four drill-holes and
- put the finished workpiece into a container

In training centres such as the Bfz Essen and the Training Centre Arbeiterkammer Bremen, such projects are directed towards standardised solutions. However, there is also a movement, for instance at the AEG firm, to conduct open projects, in which trainer and trainee adjust themselves entirely according to the actual technology being used at any one given time. As a result, the projects change continually.

The final section deals with the so-called **"Leittextmethode"**. ("The Guiding Text Method"), which has grown in importance in the Federal Republic of Germany. Its most striking characteristic is that, from the beginning of the learning process, the trainee must procure the information required to carry out the work. This is accomplished either by working alone or in a group, and through following specific instructions and answering questions. This method is implemented in particular in commercial-technological enterprises.

2. Building a Self-Learning Competency through a Development Process Related to Carrying Out Work Tasks.

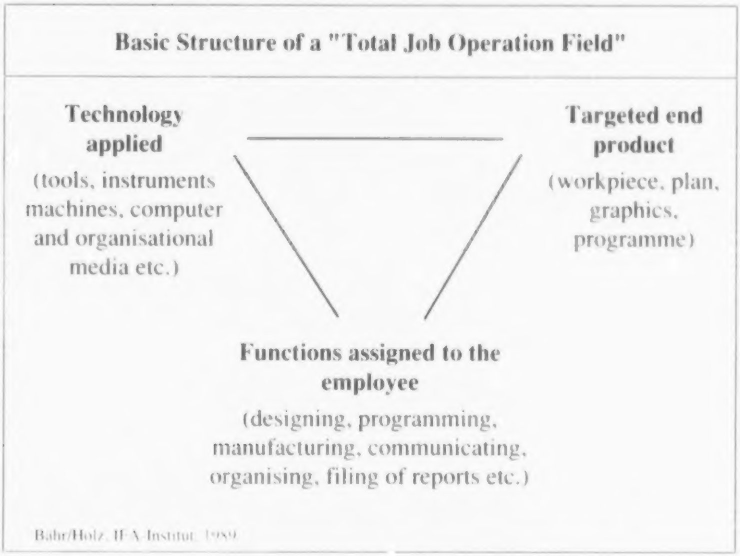
2.1 The "Total Job Operation/Action Field" ("Handlungsfeld") concept as a way of bringing together all of the functions of a job and so creating an integrated learning process.

The use of new information, communication and production technologies brings about rapid changes in technology and organisation. The job functions and competencies required by employees are thereby permanently affected. In certain cases, more demanding elements are introduced into a job. Consequently, new fields of particular job operations are constantly being created. These fields of operation can be identified by means of answering the following three questions:

1. What is the targeted level of performance (or what is the production task?)
2. Which technology is to be utilised?
3. Which functions does one assign an employee working in a certain field of operation?

In the "new" jobs (or "Total Job Operation Fields"), computer based and programmable means of production are used. Many hand-operated working processes are becoming thought processes; hand-operated tools are being replaced by "thinking" tools. Thought processes are perceived less easily and seem elusive. In addition, the combination of job functions in integrated production systems cannot easily be understood in a concrete manner.

Undoubtedly, learning through physical observation and imitation, was, and is an important component of a Self-Learning Competency, so a replacement for this exterior action must be found. An intellectual formulation must come into place which enables the employee to recognise himself in his related field of operation, and identify in detail what is required of him. By means of focusing on the "total job operation", he becomes aware of his specific qualification deficiencies, and the insight into these deficiencies is the point of departure for new, self-directed, responsible learning.


Basic Structure of a "Total Job Operation Field"
Technology applied
(tools, instruments machines, computer and organisational media etc.)
Targeted end product
(workpiece, plan, graphics, programme)
Functions assigned to the employee
(designing, programming, manufacturing, communicating, organising, filing of reports etc.)

Bahr/Holz, IFA-Institut, 1989

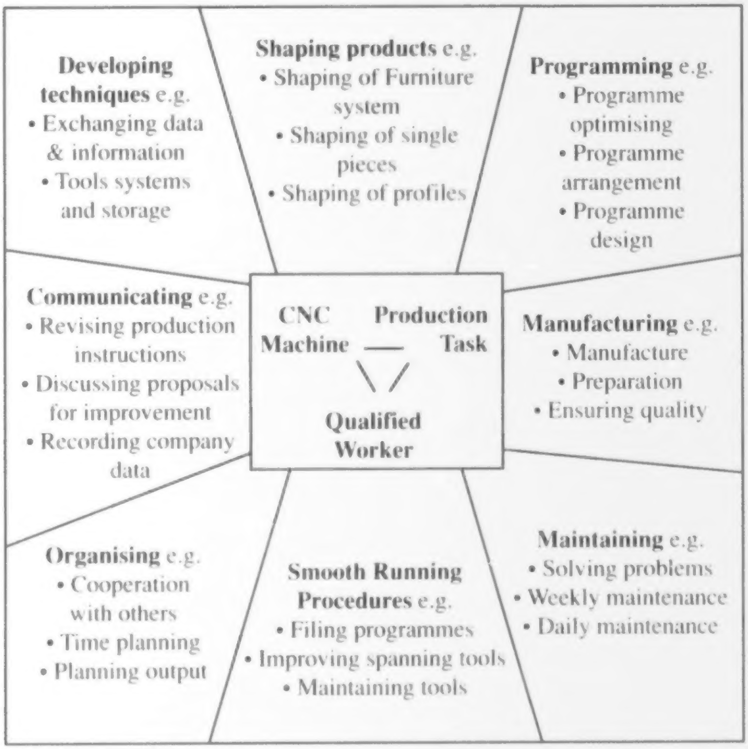
Figure 2: Representation of the essential components of a Total Job Operation Field.

This is why Self-Learning Competency is necessary. It can help people, step by step, to acquire new skills in their field of operation and so leave obsolete skills behind.

The chart shows the eight functions within the CNC woodworking domain. All functions necessitate the economical use of new technology. The model employee is the person who perceives all functions and qualifies himself for/learns all of them on his own, or with the help of others. In enterprises with many employees the functions described in the diagram are divided amongst the group. For example, programming is assigned to a planning engineer, maintenance, in whole, or in part, to qualified maintenance employees, and product design to draughtsmen and designers.

One could therefore envisage a job operation field with a limited skill level as is the case with semi-skilled workers. The opposite could also be true, for example, when a person has programming and management functions in relation to the job operation field. In small enterprises, skilled workers are confronted with a wider and deeper range of tasks which demand a higher level of all round competency.

2.2. Example : Model of the "Total Job Operation Field" (TJOF) Concept in CNC-Wood Processing



Model : One worker may undertake many different functions in a Total Job Operation Field

Bahr/Holz IFA-Institut, 1989

Figure 3 : The "Total Job Operation Field" (TJOF) Concept Seen in Terms of an Example of CNC-Wood Working

2.3 Learning according to the "TJOF" method

The TJOF concept enables employees, superiors, and trainers to introduce learning processes closely related to, and reflecting the actual work process. For this type of learning process, we have developed our own learning method at the IFA-Institute and have tested it on our training programmes. The essential characteristic of this method is that learning is organised according to the structure of the work process in the field of operation. As a result, the trainee internalises every thought and behaviour pattern as the basis for his learning. The trainee undertakes his learning with the help of the trainer, through on-the-job instruction and through specialised courses. Learning processes based on the TJOF method correspond to the structure of the work process. (See Figure 4: The organisation of learning and work in a TJOF.)

Learning according to the TJOF Method	
Steps	**Leading Questions For Learner**
1. Overall Design	What is the production task? What technology should be employed? What are the relevant functions?
2 Planning	How is work to be organised and subdivided? What must be provided in terms of time, technology, materials and qualifications?
3 implementation	Are the partial steps and achievements plausible in view of the targeted objective?
4. Feedback	Does the performance correspond in all aspects to the demands of the objective? What improvements are needed ?
5. Documentation	Who must be informed and how should this be done ? Which experiences should be communicated? How can the work process be documented in terms of brief instructions?
Bähr/Holz, IFA-Institute, 1989	

Figure 4 : The Organisation of Learning and Work in a "TJOF"

The questions in the chart relate to the behavioural requirements accompanying the process. In this, awareness of responsibility, self-sufficiency, circumspection, willingness to communicate, professional competence, and alertness, all play outstanding roles. Self-learning is also an essential aspect.

2.4 The Structure of a training programme based on the TJOF method in the wood work area.

The learning steps just described can also be used as the basic foundation for learning in a training programme outside of the workplace. (See Figure 5: The Different Layers of a Training Programme Based on the TJOF method.)

Structure of a Training Programme
Based on the TJOF method in the Woodwork Area

Targeted End Product:	door with a profiled frame made out of solid wood.
Technology Used :	CNC Moulding Cutter
Functions :	allocated to each employee according to the training objectives set.
1. **Lower Level Qualifications :**	***machine operator***- to a large degree non- independent; works for example, with programmes which others have created. (e.g. semi-skilled labourer)
2. **Medium Level Qualifications :**	***skilled production labourer***- works independently to a large degree; creates his own programmes and checks quality. (e.g. skilled labourer)
3. **Higher Level Qualifications** :	***production designer***- works independently; designs the door in accordance with CNC, plans the organisation. (e.g. highly qualified skilled worker, master, engineer)

Bähr/Holz, IFA-Institute, 1989

Figure 5 :The Different Layers of a Training Program Based on the TJOF Method.

Conventional CNC-training programmes usually begin with general introductions, proceed to programming, and gradually move on to increased skill and knowledge levels regarding workpiece geometry and programming technology, etc.

Training programmes based on the TJOF method have a different structure. They firstly concentrate on the **single field of operation in its entirety**. The participants in the training programme are trained to carry out the whole job in its entirety, from the beginning, as in level one in the diagram (See Fig 5).

Training for the second level then follows with the same workpieces being used. The trainee has already mastered the production and handling of these workpieces. At this level he now acquires, amongst others skills, the competence **to programme the workpieces**, to check on quality control, etc.

At the third level he acquires the competence **to design, plan and organise his work in a way that he sees fit.** Job-enlargement and job-enrichment are the central didactic ideas at this stage of the training programme.

This approach to training allows the participant to develop at a gradual pace. Such development is accomplished through an increase in responsibility. It stimulates and strengthens **the willingness to learn** which is one of the dynamic components of "Self-Learning Competency".

3. The Development of Self-Learning Competency through Project-Oriented Learning in Initial and Further Training

3.1 Projects Dealing With Steam Engines, Turbines and Robots.

Since the sixties, on-the-job training projects have existed as alternatives to systematic training programmes structured and sequenced according to subject matter.

In general, "project oriented learning" in vocational training is characterised by the following features:

- the products are manufactured by trainees
- these products do not appear among the usual output of an industry

- in general, these products have been developed specifically to pass on information and develop skills
- information and skills are passed on in an analytical manner rather than in specific subject matter setting.
- the trainees experience how products come into being through the interaction of practical knowledge and various types of skills.

Through project oriented training, responsibility towards one's job, the ability to think coherently, and to carry out tasks independently, and in a persistent manner, are promoted. Technical competency is also acquired, of course.

Project work is often different from present on-the-job requirements because technologies and working methods are used which are no longer in demand in the industry. Trainers frequently provide routines or adjust machines in order to compensate for missing prerequisites in the trainee's area of qualification/skill. Problem-solving projects such as the steam engine are highly popular in many training programs, particularly among trainers in external and on-the-job training courses in educational centres.

The development of a Self-Learning Competency in this context depends essentially on whether or not trainers use all the necessary means to foster independent planning, job organisation and information gathering. The head of training, in a large business, related how he did not allow his trainees access to the project on the technical remodelling of the steam engine, because they were not able to exhaust all of the methodological possibilities - in the sense of independent learning and the development of learning skills

Examples of Projects

A project, dealing with an open gas turbine with a generator and switchboard, forged the first link between mechanics and electronics. The project was developed in the training programme of Thyssen Edelstahlwerke in Krefeld, and it involved several types of professions. Moreover, the project presented an opportunity to discuss basic scientific points of view about energy conversion, as well as consider rational energy uses in the products created by the trainees themselves.

In the Nuclear Research Centre of Karlsruhe, trainees build different versions of robots with six axles. Work on the projects is conducted by trainees in their fourth year as engineering draftsmen, mechanics, and electricians. To begin with there are discussions about the projects, during which the trainees plan to carry out different assignments. In the construction phase, the "designer" team stays in close contact with the "metal" team which is developing the mechanical section of the robot. In turn, these two teams work closely with the "electronics" team, which is developing the steering mechanism. The trainer's role here is an advisory and consultative one. Experience gained on this training endeavour revealed that through working together on projects the trainees' "self-qualifying skills" are promoted.

3.2 Projects Whose Objectives Have Been Derived From Company Practice.

New training regulations were introduced in the FRG in 1987 for jobs in the metal and electronics industry. These national regulations require trainees to be qualified by means of assignments which involve independent planning, implementation and control. Such requirements lead one to look at the value of direct on-the-job training. Daimler Benz and partner companies, for example, have in fact conducted a pilot project on "optimising the use of trainees by companies".

In general, there is a tendency to shorten the duration of the training period in vocational training workshops in favour of **training in actual production departments**. In the case of office jobs, (e.g. in Daimler Benz), trainees learn to undertake all the different job functions in their respective fields.

Ideas concerning project-work are also changing nowadays. AEG's "Integrative Training Concepts for Metalwork" can be singled out as an example. A facility for the automatic production of angle fasteners was developed and produced by trainees working together as a group. This will not be developed in the same way again, since the trainers are required to continually work with trainees on new functions and technologies. The new industrial technologies that are to be applied, along with the products, determine the outcome. Another project led to the construction of a measuring and testing facility for solar cells, as products of this type are manufactured in this AEG enterprise.

A key feature of these projects is that they are derived from current practice in industry. The trainees can thus use the experience gained from these projects to prepare themselves for their future professional life, in which they will be continually confronted with new assignments.

Karlheinz Müller, head of training at AEG explains: "In our company, the traditional forms of work division is increasingly giving way to the integration and dovetailing of assignments. The result is higher qualification requirements for workers and more room for design decisions and the delegation of responsibility. These requirements must be met by up-and-coming employees who get involved in the thought processes, participate in planning, solve problems on their own and take on responsibility."

4 . Use of the "Leittextmethode" *

4.1 Characteristics of "Leittextmethode".

The central purpose of "Leittextmethode" is to give trainees a structure to learn independently. The "Leittextmethode" consists of printed course materials which both stimulate and support independent learning. The trainer does not present information but acts as an adviser to trainees. In principle, the trainees are more actively involved than the trainer.

"Leittextmethode" usually includes the following:

- Guiding Questions: the responses help to clarify the instructions relating to the tasks to be undertaken.
- Work schedule and documents: these materials help organise the sequence and manner in which the work is to be executed.
- Check lists: these serve to evaluate one's own and others results.
- Key sentences: information necessary for the understanding of the task and its proper execution is summarised.

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* The term "Leittextmethode" can be translated as the "Guiding Text Method", taking text in the broad sense to mean focused **questions,** carefully broken up **training materials, check lists** etc.

The "Leittextmethode" Cycle can be portrayed as follows:

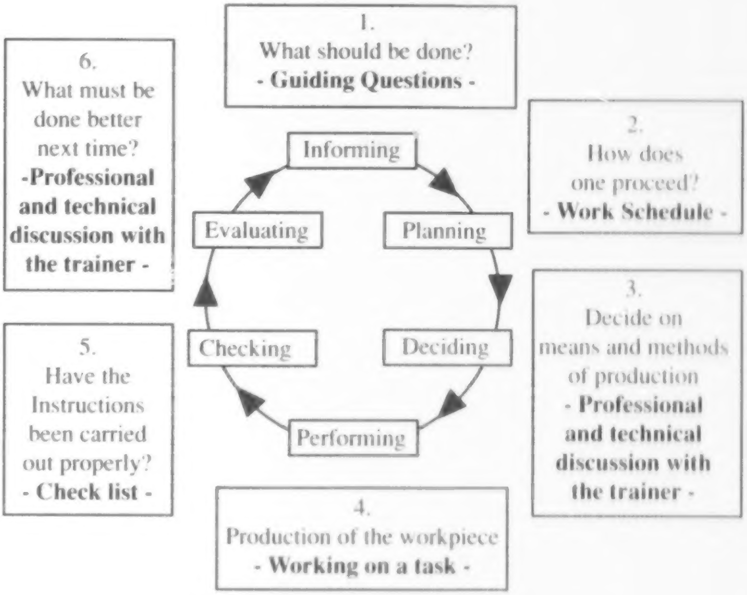

Figure 6 : The "Leittextmethode" Learning Process

4.2 Overview and Examples of Applications

History

The "Leittextmethode" was used initially in Gaggenau, in a Daimler Benz AG training programme, where the model steam engine project was undertaken. A similar system was used in the training of tool-makers at Fords. In the Peine-Salzgitter AG steel works this method developed into a universal teaching-learning system. The Hoesch-Werke in Dortmund further developed the idea with the aim of applying it to job-tasks. It has also been used in non-industrial enterprises, for example, in the Youth Employment Help Project in Essen which deals with off-the-job training for youths who find it difficult to gain employment. This agency has developed "Leittextmethode" relating to specific job assignments, e.g. the measuring of doors and their subsequent manufacture in the workshop. The introduction of these methods in the Essen project has:

- stimulated the self-learning process
- offered each trainee his/her individual pace for learning and working in order to achieve desired goals.

A new example

The German Federal Post Company has created a new profession, called "Communications Electronics Engineer". Trainees formerly moved from one trainer to another in order to systematically acquire new information and skills. Now, 70% of training is carried out by means of "projects" which the German Federal Post Company has designated as "modules". Printed materials and other sources of information support the project work. In the first year of training alone, approximately 50 modules are available. Some of these modules are compulsory. To some extent the trainees are able to choose or vary the sequence of the modules they take.

The "Leittextmethode" is used as a form of supplement, to meet the following objectives:

- typical basic skills, for example, drilling and soldering
- knowledge of fundamental principles
- support for work assignments

Conclusion

There is a strong movement in the Federal Republic of Germany towards self-steered/autonomous learning processes. This puts less emphasis on the dominant role of the trainer. Rigid structured approaches are being done away with. In their place, systems such as "Leittextmethode" are being introduced. The passive-receptive approach to learning is making way for active learning. These texts encourage self-motivation and decision-making skills in trainees. This means that the overall qualification goal is seen in terms of developing "the comprehensive ability to act, in a professional, goal-oriented and responsible manner"

Chapter 9

Developing Skilled Learners : The Experience of ICI and SHELL in the UK[*]

M.Pearn and S.Downs

There is a great deal of change occurring in industry and in the world of work generally. We frequently hear that change will be a permanent feature of work and is not just a passing phase during which employers get shaken up, or shake themselves up. Successful organisations now and in the future will be in a permanent mode of change and adaptation, not only in relation to technology and working methods, but also to socio-cultural matters both within the organisation and society at large. Part of the challenge of change lies in identifying those things that can prevent undesired or unnecessary changes from occurring.

The main barriers to change include individual attitudes; fear of the unknown; fear of not being able to cope; a desire to hang on to the familiar, the tried and tested; ignorance of how you as an individual will be affected; dependency on established patterns; a fear about not being told the whole story; lack of confidence in those who try to bring about change because they cannot answer all the questions; an emotional resistance to change itself.

The changes occurring will not only accelerate, but will spread deeper and wider into the economy as a whole. Consequently, it is essential that we have mechanisms and techniques that will help us cope. Some people are by nature more able to manage than others, but no one can cope with change that they do not understand. If people can be helped to increase their capacity to understand, they have a mechanism within themselves, by which they can learn to cope with change. We are not talking about elaborate theory or model-building, but simply about **developing people's**

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[*] The research and development work on Developing Learning Skills was initially funded by the Department of Science and Education and subsequently by the Manpower Services Commission, in the U.K.

people's learning skills. In the simplest of statements however lies the greatest challenge.

There are a number of benefits associated with the development of learning skills. People who consciously become skilled learners gain in autonomy, and take more responsibility for their own learning and development. In a continuously changing environment this has obvious advantages. Skilled learners have confidence to take on problems they previously avoided. They reinterpret events they previously feared, as opportunities and challenges. They perceive fewer barriers. They transfer their learning from one situation to another, giving them greater flexibility. Finally, skilled learners are more likely to develop a sense of well-being and fulfilment.

These are big claims, but are well supported by research, and by practical examples which are described in detail later on.

But why is the emphasis on **learning** and not training? The answer is to be found in the two following statements:

People do not have to be trained in order to learn

People often learn in spite of the training they receive.

Training is essentially a means to an end, to bring about learning. It is evident from many sources however, that training does not always bring about the right kind of learning. An emphasis on learning is not incompatible with training but learning is a wider concept. You can have good training and bad training, and by definition good training produces the right kind of learning. Our concern here is that the dazzling potential of the new technologies in training and the excitement generated, may take attention away from achieving the right kind of learning, and substitute a preoccupation with the efficiency of the new technologies of training. The hardware and the software are subordinate to the need to achieve the right kind of learning, and not the other way round. In other words, we should not be using interactive video merely because it is available to us. The learning design must come first.

What do we mean by competent learners? The concept and the techniques for developing skilful learners derive from the research carried out by Sylvia Downs and her colleagues over a period of eight years, first, at the Industrial Training Research Unit at Cambridge, and subsequently at the Occupational Research Unit, University of Wales Institute of Science and Technology. The early research was funded by the

Department of Education and later on by the Manpower Services Commission. Both bodies were interested in finding ways of making learning processes more effective, not by concentrating on training methodology, but on what trainers actually do when training, and on the ways in which people actually learn. One of the early findings in the research was that there are a very large number of ways to learn, and that many people only use a small number of them. Skilled learners tend to use a larger variety of ways than less skilled learners, and match the way of learning to the type of material to be learned. The research also showed that people could, through appropriate exercises, increase the number of ways of learning open to them and choose appropriately between them.

Experimental studies showed that, as a result, they could transfer their learning more effectively to new situations than previously. By learning about learning, or learning things in such a way that the processes of learning are more conscious, people became more highly skilled learners. We have labelled this approach - **Developing Skilled Learners** or **DSL**.

This list is neither exhaustive nor definitive. It serves to illustrate some of the behaviours displayed by skilled learners. It also shows that learning is a skill that can be developed, practised, and improved, or one can talk about practising and fine tuning learning skills. They are both sides of the same coin.

The real challenge however is: How can this be achieved in practice in real settings. The research carried out by Sylvia Downs and her colleagues at the Occupational Research Unit, and more recently at Pearn Kandola Downs, (PKD), has all been conducted in real learning situations and not just laboratories with simulated learning tasks. Consequently, the DSL approach has been developed and tested in the real world, with learners ranging from the long-term unemployed to research chemists. Two applications of the DSL approach which was integrated within an overall strategy of change are now described. The two organisations were very different in the challenges presented. Imperial Chemicals Industry (ICI) Agricultural Division, now part of the Chemicals and Polymer Division of ICI, was no stranger to change. The Division saw continuous change as an integral part of being a large successful and mature organisation. As far as possible change was forecasted and described so that the organisation could take steps to adapt easily and smoothly in line with the new conditions. They had learned from experience that new ideas, which sounded very good, would not survive unless supported by a philosophy and conceptual framework into which the ideas would fit. The concepts and techniques of DSL were injected into a model for bringing about change that had worked well in the past. In short, DSL was being used in a large, complex and established organisation to facilitate changes that had already been identified and defined.

DSL means that:

1. Skilled learners take responsibility for their learning and generally adopt an active role.
2. Skilled learners can distinguish between things they have to memorise and things they need to understand, and things that are best learned by doing.
3. Skilled learners use more ways of learning and choose between them according to the material to be learned.
4. Skilled learners do not fall back on trying to memorise things they should be trying to understand.
5. Skilled learners make conscious decisions on how they will learn something.
6. Skilled learners make sure they learn despite poor teaching.
7. Skilled learners ask more questions and ask particular kinds of questions to ensure that they learn properly.
8. Skilled learners seek feedback on their own performance.
9. Skilled learners realise that difficulties in learning are not always a lack in their own capacity to learn but frequently lie in inadequacies in the delivery of learning/training.
10. Finally, skilled learners are confident to take on new learning opportunities.

The other application was very different. A major energy company had been building a computer-integrated plant to blend, package and distribute 2,500 product/package combinations. In manufacturing and systems control technology the plant represented a quantum leap in technology for the company. Although some components of the new plant had already been automated in other sites, both in Britain and abroad, nowhere else in the company had a plant of this sophistication, integrated by one computer system, been developed. The company had no experience anywhere in the world of running a plant of this complexity. Naturally, the company was preoccupied with the problems of designing both the software and the hardware, and the immediate problem of constructing the plant in a greenfield site. Another important factor contributing to the challenge was that the brand new production plant was, for the first time, to be located within a marketing company in the Group and not in a manufacturing company, as had been the case in the past. Associated with the change from a manufacturing to a marketing environment, was a declared commitment to a new culture which the company referred to as 'shared values'. Although never fully defined, as they were constantly evolving, the 'shared values' focused on more open management, increased individual responsibility, commercial awareness in all employees, greater flexibility, a flatter more friendly and responsive organisation. All this had been worked out at the design stage of the project, but it was recognised that once created, the new plant would continue to develop its own culture.

Because of the pressing need to finalise the hardware and software, and the construction of the plant, probably one of the most complex computer-integrated plants in Britain, it was not too surprising that not enough thought had been given to the needs of the people who would actually run the plant and develop its culture. The new employees were going to be drawn from two existing plants, one of which was to close down once the new plant was operating successfully. The manufacturing technology of the old plant dated back to the early part of this century and very few of the traditional skills and tasks would be required in the new plant. Virtually none of the operatives had had any direct experience of computers, keyboards, or VDUs. It was as though they were leaping from the nineteenth century straight into the twenty-first.

An analysis which we carried out summarised the changes as follows :

	From	To
Organization of Work	Defined jobs Demarcation Hierarchy Discrete functions Groups	Tasks, activities, roles Flexibility Flat organization Interdependence Teams
Job Performance	Physical, manipulative work Specifics, concrete Immediate feedback Localised impact Localised information	Greater emphasis on concepts and understanding principles/ideas Remote feedback Widespread impact Widespread system monitoring
Job Demands	Working groups Safety in numbers Close supervision Restricted decision making A learned, static environment	Dispersed teams Isolation/vulnerability Autonomy/self-monitoring Devolved decision making A learning, changing environment
Problems	Known/proven technology Stable environment Predictable Familiar problems	State-of-the-art, not yet trusted Dynamic environment Uncertain No prior experience
Values	Imposed/acquiesced Implicit Production oriented Do what you are told You don't need to know	Shared/internalised Explicitly examined Marketing oriented Understand reasons Understanding the business

It was realised that a great deal was being asked of the new employees and that special care needed to be taken to ensure that they could adapt to, and cope with, the new world in which they found themselves. Accordingly, it was decided that part of their induction should specifically be designed to develop their capacity to learn.

By way of summary, the two situations looked like this:

ICI AGRICULTURAL DIVISION	SHELL BLENDING PLANT
existing complex of plants	new plant
existing workforce	new workforce
established culture	new culture
part of a wider network	relatively isolated
mixed technologies	state-of-the-art
strong commitment to training	no training function
model of change	no model of change
commitment to change	shared values
receptivity to new ideas	everything new

Agricultural Division

The process began when a personnel specialist at ICI heard about DSL at a conference and invited Sylvia Downs and her colleagues to meetings to discuss the approach. They later demonstrated the effectiveness of DSL by re-writing some computer-based training material, and subsequently running a trial workshop for a small number of Divisional managers. The workshop was necessary as the researchers had discovered that unless they experienced the processes of DSL, many managers confused what they thought of as good training practice with Developing Skilled Learners. It was a shock to some of them to realise that a great deal of good training actually prevented the development of skilled learners, even though it did enable people to learn specific skills. The Division realised that the changes it needed to make depended on the workforce transforming itself into adept flexible learners and that DSL fitted into their model of change.

A further workshop was organised for twelve selected trainers so that they could experience the DSL techniques. The twelve would then be charged with disseminating the concepts and methods throughout the Division. The novelty of the DSL approach lies in both method and in content. The change in content stems from paying as much attention to **how we go about learning** (i.e. the processes) as to what we learn (the product);

traditional training concentrates mainly, and some times solely, on the product.

DSL introduces the simple mnemonic MUD which divides learning into the different ways we use to learn. Exercises are introduced so that learners discover different ways of memorising (the M of MUD). Gaining understanding (U) is helped by thinking of reasons or purposes for what one is trying to understand; beginning with a definition of the subject matter; thinking of things which could go wrong, of causes and effect, prevention and cure; looking at things from other viewpoints; and comparing and contrasting with similar and dissimilar things with which one is familiar. This technique is called the Keys to Understanding. Another technique used was the Questioning Demonstration in which a task is silently demonstrated and the learners are invited to ask any question they like prior to, as well as during the demonstration. The questions are answered fully and are recorded on a flip chart.

Following the demonstration, and after the learners have performed the task for themselves, the questions are examined to identify which ones were most helpful to learning the task. In this way, the learner not only learns how to perform the task, but also becomes aware that certain kinds of questions are far more helpful than others. In this and other exercises, when learning a product the learners also learn about identifying and correcting mistakes, the value of errors in increasing understanding, the need to avoid early errors when memorising or learning to do something, how to develop standards, how to get feedback, as well as observing, listening and recording.

The methods used by trainers are in line with the above objectives. Accordingly, learners are often asked to work in pairs using worksheets. This is less threatening to the individual and the learners discover the benefits of shared learning, including stimulating each other, and the impressive range of ideas that are generated within the groups as a whole. "Pondering sessions" are introduced during which learners consider the purpose of a training session, what they think they have learned, and how they might apply what they have learned. As far as possible concepts are developed by the learners rather than supplied by the trainer. Formal talks and lectures are replaced with prepared exercises which are used to develop concepts in the learners. Another session helps learners identify what prevents learning, and to develop ideas for overcoming learning blockages. Many of the blockages identified relate to the trainers or at least to poor and inexperienced trainers. Due to the fact that an increasing amount of training in the future will be done by non-specialist trainers, the ability to learn form supervisors or product experts, who are not necessarily skilled trainers, becomes increasingly important. The DSL approach is to make the learner actively responsible for learning, and to break out of the traditional passive role.

Evaluating the impact of DSL on the Agricultural Division

Evaluating the effects of an intervention in a complex organisation is always difficult. It was decided that the evaluation would take the form of examining the extent to which the concepts that were introduced in the initial workshop survived over a period of time, assessing the extent to which DSL was being introduced, and looking at future plans to implement it. Three months after the original workshop, the participants' action plans were on schedule. After five months a DSL course conducted by ICI staff who attended "our' DSL course was observed. It was found that the training material used had been redesigned to meet the needs of ICI and that the methodology followed was true to the principles of DSL. After twelve months, eight of the original twelve participants and eight second generation DSL trainers had applied DSL in about thirty different ways. These included courses on DSL, the re-design of an induction course, supervisor training, training of trainers, management familiarisation, interviewing techniques, computer-based training packages, and also Youth Training Schemes. The ideas and techniques has spread beyond the Division and had been applied in local schools, church groups and in the trainers' own homes.

A basic shift had occurred away from training practice used to teach product or content only, towards the DSL approach of helping learners be responsible, adaptable, and versatile in their approach to learning. The lessons from ICI were that the ideas had been introduced and disseminated gradually, so that they did not merely take on the flavour of the month - here today and gone tomorrow. Instead an awareness was built up, and a demand created, which was then satisfied. In short, the development of skilled learners was stitched firmly into the prevailing culture of facilitating and fostering meaningful change. The only intervention by the researchers of any substance was the five-day workshop for the original "twelve disciples". The seeds had been cast on well prepared soil.

The Computer Integrated Blending Plant

Formal exercises to develop learning skills were incorporated in the induction of new employees to this futuristic looking and somewhat intimidating plant. The reasons for this were to overcome employees' fears about the new technology, and allay their anxieties arising from the many uncertainties, in particular the company's policy on 'shared values' which had not yet been tested on the ground. In the seventeen-day induction, four days were devoted to DSL. The rest of the training, which had been designed according to DSL principles, introduced the new employees to computers and the new technology, and also developed an understanding of the business in commercial terms. In addition, the induction was used to familiarise them with the plant, introduce safety requirements, etc. "Ponder sessions" were used regularly, including a three-hour "ponder" on what the induction had achieved and what they personally had learned at the end of the induction period.

A feature of the induction was that all the training was carried out by the management team, none of whom had taken a training role before. The manager of the plant also played a prominent role in the induction. His presence and his desire to encourage the trainees to learn and continue in a permanent mode of learning was seen as one sign of the new culture. The induction was also designed to foster, from the outset, the forms of behaviour in employees that were considered vital to its implementation. These included the development of autonomy, effective teamworking, being a skilled and adaptive learner, the capacity to understand, and the capacity to cope with change and adjust to the new and continuously evolving culture.

The four days of the induction specifically devoted to DSL focused on overcoming learning blockages, increasing the number of ways of learning, developing effective question techniques, improving observation skills, note-taking, getting the most out of the instructor, coping with poor or inadequate teaching, techniques to aid understanding, memorising and learning physical activities.

At the end of the induction, the new employees were asked what they thought they had gained from the induction. Their answers were as follows :

Most important things I have learned:

New Learning Skills	24%
Team Working	10%
Understanding of the Business	21%
Plant Familiarisation	6%
The New Technology	9%
Safety	3%

The most important things the induction has achieved :

Capacity and confidence to learn	30%
Commitment	24%
Team-work	17%
Acceptance of change	8%
Understanding of the new plant	17%
Understanding the new values	6%

In addition, the technical training, which followed on immediately after the induction, had been designed according to DSL principles. These principles had been discussed with the training designers who accepted them as evaluation criteria against which the acceptability of their training material would be judged. Failure to meet the criteria would result in the training module being rejected until it met the agreed standards.

Specifically the principles were:

1. Concepts should be developed by the trainees and not given in advance by the trainer.
2. Trainees should be given maximum opportunity for transferring what they have learned to new situations.
3. Trainees should be given maximum opportunity to seek information for themselves.
4. Training material which needs to be memorised should be clearly marked in the training manual.
5. Errors should be used by the trainers to aid understanding.
6. Trainees should be given maximum opportunity to ask questions.
7. Trainees should be given maximum opportunity to check their own learning.
8. Training modules should accommodate individual differences in preferred ways of learning.
9. Jargon and technical terms should be avoided until the trainees are familiar with them.
10. Review and revision of learning should be an active and not a passive process.
11. Trainees should be aware of what is expected of them at each stage in the module.

The induction had developed the new employees' learning skills and they had high expectations of the trainers. On one occasion the trainees complained to the Plant Manager that the external trainer was not abiding by the agreed standards, and that they were not learning because he was sticking to a timetable he had created in his head and was rushing things. After a warning from the Plant Manager, the trainer failed to meet the desire of the trainees to learn and he was dismissed. On another occasion trainees, when asked what effect the induction had had on them, answered by saying that they felt they had a responsibility to ensure that everybody in the plant learned successfully. As one trainee put it: 'We don't let the trainer move on until we have ALL understood'. Further anecdotal evidence of the impact of the DSL approach came from one of the overseas equipment suppliers to whom some of the employees had been sent for special training who said: 'Where did you get these people from? Our trainers have never been asked so many questions before!'

It is difficult, if not impossible, to separate the specific effects of the DSL approach from all the other happenings during the creation of the plant. None the less, it was strongly believed by the management team that developing skilled learners during the induction, and designing the complex technical training according to DSL principles, was a major factor in helping create the new culture. It also build up a reserve of good will and tolerance of frustration that stemmed from a greater understanding. Failure to understand in the old culture would have been dubbed as having a negative attitude or lack of cooperation.

A study carried out to investigate the work-force's thinking on the subject of progression, promotion, and performance appraisal (the latter being an entirely new concept) revealed a concern for fulfilment, responsiveness to individual needs, fairness, coupled with an understanding of the business needs of the plant, more so than a need for survival and a preoccupation with money and status. All the signs indicated that a mature, adaptive workforce had been created in a permanent mode of learning and development. Although major technical and operational problems remained, the management was confident that it had got a workforce which could learn to solve its problems and shape its own culture

Chapter 10

New Starting Points for European Vocational Training

Birgitt Feldmann, Jörg Kluger, Jochen Langenbeck *

1. The Need to Redesign the Workplace

The workplace has traditionally been designed according to the requirements of technology rather than people. The argument put forward by people supporting this viewpoint is that because a machine works more accurately and faster than a human being, it must have a dominant position. But what happens if the machine makes a mistake, or if it breaks down? A machine also carries out every command, even if it means destroying itself in the process! Nevertheless machines are highly respected. The following experience illustrates this:

> When visiting a small company the owner took us through the offices and remarked casually: "This is the purchasing section" - the three people working there did not seem to be of any significance. "And this is the sales office" - the four people working there also seemed to be quite unimportant. We went into the next office with four employees, quite obviously the accounts department - with a feeling of pride and excitement the owner remarked: "and this room houses our computer" !

In accordance with the pride of place given to technology therefore, computerised machines tend to have a dominant position in the workplace. This applies to small and medium-sized and large companies alike.

However, a change in outlook is taking place today: people are more and more aware of the dangers of the dominance of technology and are

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* The authors would like to express their thanks to Norbert Meyer of the Bfz, Essen, for his comments and general assistance in the writing of this paper.

endeavouring not to allow the human factor to be neglected. Human beings are capable of doing much more than just reacting. The demand for work organisations which fully utilise human potential is growing.

In a "high-tech" environment the human being is often considered to be unreliable. This belief lay behind General Motors' introduction of the fully-automated factory in the USA. In practice, however, the dominance of machines over human beings had absolutely no effect on productivity. The resulting unemployment was indeed a major negative effect. ("The Independent ", October 10th, 1988).

The USA, the pioneer of the latter approach to technological development, has now recognised that it is wrong to view people in the workplace as liabilities, to be dismissed and hired at will. The message coming from the USA, at present, or more precisely from the Massachusetts Institute of Technology, in its report "Made in America" (Derfonzos 1981), is that people should be viewed as cultural assets and enrichers of the production process.

European countries have always been keen to emulate the USA and there has always been a time-lag in the implementation of the new thinking. On this occasion, it has turned out to be advantageous, as Europe is being forced to bring its traditional strengths more and more to the fore.

This paper firstly looks at the qualification requirements of the skilled workers in the technical and commercial sectors, in the context of a "high-technology" workplace designed to maximise the human contribution. The training implications, following on from this in relation to initial and in-company training, are then examined.

2. Qualifications Required by Skilled Workers

A way to outline the qualifications required by skilled workers is to focus on "**the ability to act in the real job situation**" ("**Handlungskompetenz**"). The ability to apply one's knowledge and skills to deal with complex, and often "once-off" tasks, is the starting point for any analysis of the qualifications required by today's technological workers. This "ability to act" has three dimensions (or qualification sub-groups) which are outlined in the diagram below.

Competence to act in a real job situation

Technical Qualifications	***Methodological (Process) Qualifications***	***Social Qualifications***
Understanding of computer-supported machines, equipment and facilities	Ability to process possibilities and work out ways for tackling and solving problems	Willingness and ability to work in a team
		Ability to assist in the design of the workplace
Knowledge of components in modern control systems and how they interact	Ability to deal with complex tasks in computer-supported environments either independently or as part of a team	Willingness and ability to learn/ "find one's way" in a new field of activity
Understanding of the history of technical development		

2.1 Qualifications Required by Skilled Workers in the Technical Sphere

The rapid developments in science and technology and the increasing rate of technological innovation make it impossible to train workers for a specific workplace. Points in time in which the amount of technological knowledge has "doubled" since the beginning of industrialisation, according to criteria set down by Dieckow (1984) are as follows :

1800 - 1900
1901 - 1950
1951 - 1960
1961 - 1966

Skilled workers of the future therefore must attain qualifications which are based on a multiplicity of jobs and training paths. The increasing variety and complexity of the qualifications required, and the growth of knowledge in today's world, can only be dealt with through a process of autonomous, life-long learning.

2.1.1. Influence of Computer Aided Systems

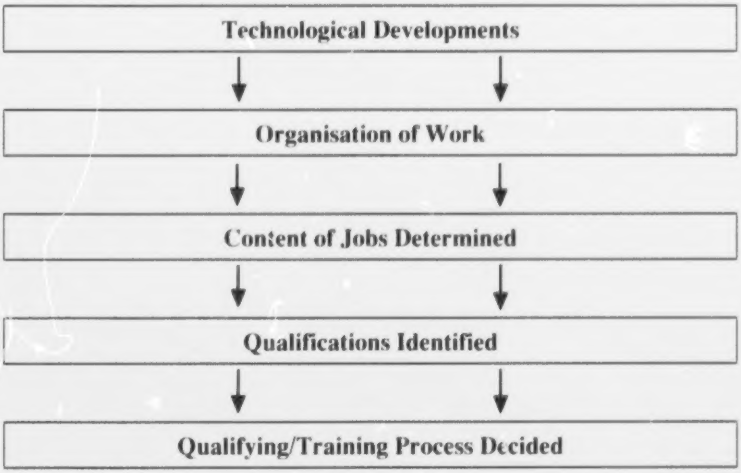
In investigations about the use of modern information and communication technologies, the questions which dominate tend to deal mainly with the sheer functionality and interrelationships of the technologies. Technological development is often viewed as a process which runs on its own, totally divorced from economic, social and political issues. Yet at the same time it is the "new technologies" which open up new possibilities in the areas of organisation of work, workplace design, human resource development and qualifications. This can result either in new hierarchies and centralisation, or in the decentralisation of decision-making processes and a shift of autonomy to the skilled workers.

2.1.2. A New Way of Looking at Qualifications

It goes without saying that due attention must be paid to the future development of technology in relation to changes in the labour market and vocational qualification requirements. In this respect accurate knowledge is needed. This should not be restricted however to a state-of-the-art technology analysis and an examination of the way in which labour is **currently** organised. It must also take future developments into consideration. Connected with this is the need for a reorientation in vocational training so that employees' careers can be developed to enable them to enter new fields.

Normally, the assessment of qualification requirements is based on the prevalent technological developments and the manner in which work is currently organised. Based on these two factors, the content of jobs, the qualification requirements and the qualifying/training process is derived. This is illustrated below :

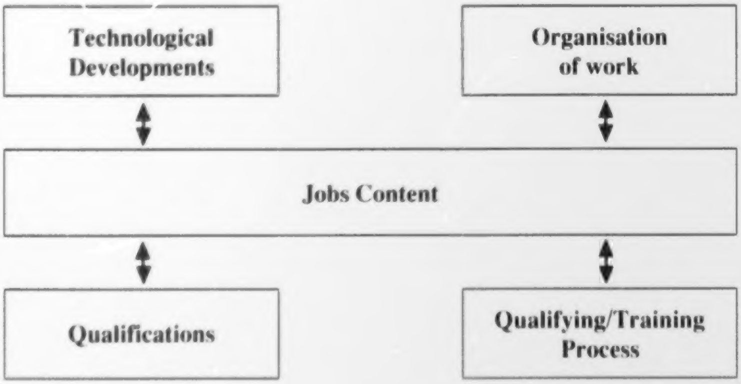
Conventional Way of Determining Qualifications


Technological Developments
Organisation of Work
Content of Jobs Determined
Qualifications Identified
Qualifying/Training Process Decided

In an analysis of qualifications however, a machine-oriented ("technocentric") and a human-oriented ("anthropocentric") point of departure, are both possible. The means to cut back on standardised routine Tayloristic activities, in favour of integrated, creative and autonomous ones is an option. On the other hand, the possibility exists that human activities, seen as "left over jobs", will be simply adapted to fit formal automatic processes and structures, leading to the neglect of the employees' creative potential. (Brödner, 1986; Cooley, 1987).

The development of technology must aim at achieving a balance between what is socially desirable on the one hand, and technically possible and feasible on the other hand. This development is not a linear process which automatically leads in the "best" direction. Appropriate planning and design is required to attain the desired goals. An upgrading and enrichment of skilled work, to include activities such as planning and decision-making, must take place. A multi-focused way to determine job qualifications in which all of the interdependent factors, mentioned above are taken into account is illustrated below:

Innovative Way of Determining Qualifications



In order to deal with technological and work organisational developments, the **long-term planning** view of training is necessary. To wait passively and see how things develop, means that the further education sector can merely react, on a short-term basis, to the "crisis needs" which arise. In the face of development cycles which are becoming faster and faster, such a strategy makes little sense, and the opportunity to proactively influence workplace design and organisation of work is lost. (Meyer et al., 1988).

It is feasible to survey technological and labour organisation developments and estimate qualification requirements at a relatively early point in time. In this way unsystematic measures to respond to "acute" qualification needs become unnecessary to a greater or lesser extent. The sort of situation which arose during the initial introduction of CNC machines, when much effort was invested in imparting elementary knowledge of specific machine control systems, would not need to be repeated.

The development of qualifications must be seen as an innovative corporate strategy and not merely as a cost factor. In addition, vocational training should be reoriented, so that qualified employees are involved in active ways in planning and anticipating change.

2.1.3. New Qualifications Required

It has already been stated that skilled workers are required to develop competencies to deal with a production process which is becoming more and more complex. In this respect, the ability to think in terms of **"networked structures"** is a critical qualification. The acquisition of these types of skills can only take place in an integrated training context. Theoretical and practical elements must be integrated and the production environment must be simulated in Training Centres to the greatest extent possible.

Modern production methods require skilled workers to act in a wide variety of areas, such as:

- commissioning
- programming
- optimising
- operating
- troubleshooting
- undertaking maintenance
- designing

To cope with this wide variety of tasks demands a comprehensive understanding of the production control process, as well as the nature of modern work organisations.

2.2. Qualifications Required by Skilled Workers in the Commercial Sphere

New technology leads to a systematic rationalisation of the entire flow of communication and information in the Commercial Sector. It changes traditional Tayloristic organisational structures. Operations previously organised as different tasks, are replaced by all-round processing. The changes which we can expect in operation sequences, in areas of responsibility, and in the relationships between colleagues and superiors, present problems which can only be overcome through independent working, taking responsibility, and through new forms of cooperation. Professional competence is no longer dependent on specialist knowledge alone, but more and more on personal and social skills.

In the commercial field, changes in qualification are occurring in three areas:

1	2	3
Commercial Knowledge	Knowledge and skills in relation to technology	"Key" Qualifications

2.2.1. Commercial Knowledge

A grounding in basic economic knowledge makes it possible to cope with the problems of structural and organisational change. The computer can relieve skilled workers of routine activities, and can even help them in making decisions, but complex commercial activities cannot be taken over.

Macroeconomic, microeconomic and legal knowledge is essential if contexts are to be understood and weak points and problems traced. Detailed knowledge does not have the same importance as before, but employees must be able to call it up from manuals and data bases as necessary.

2.2.2 Knowledge and Skills Required to Work with New Technology

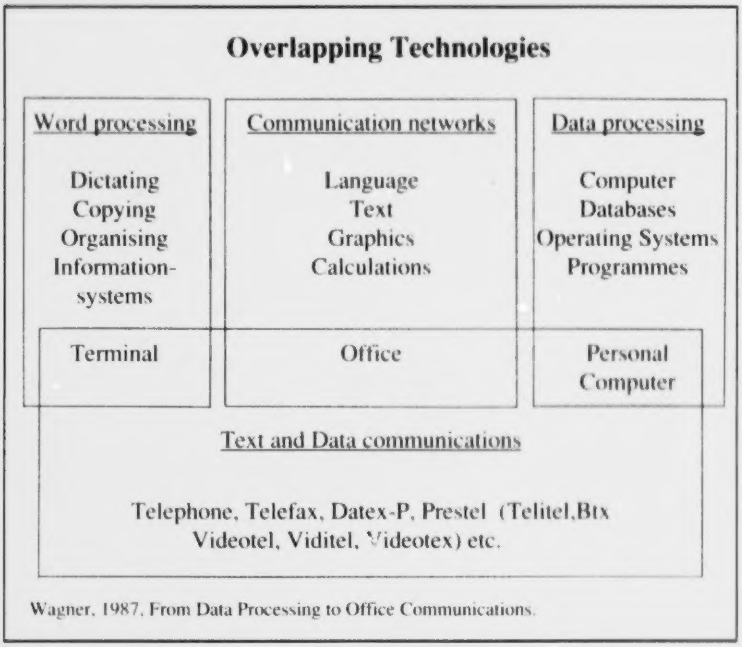
The development from linear Tayloristic sequences to complex networked structures, can be illustrated by looking at the following three diagrams. The first two depict the progressive widening of the Commercial Clerk's relationship to Electronic Data Processing (EDP) systems over the past number of years: from a passive role to that of a communications "manager", and from isolated applications to expert systems. The third diagram illustrates the overlapping manner in which new technology is implemented in practice.

Passive Role ——> Communications "Manager"

1960	Passive Relationship
1967	Co-determination
1970	Commissioning agent
1975	Responsibility for control
1980	Master of the technology (at least in part)
1985	Communications "manager" at the multifunctional workplace

From Isolated Applications ——> Expert Systems

1960	Isolated applications (simple autonomous accounting using stand alone programmes)	Data processing at **execution** (rank and file) level only.
1970	Integrated data processing (Distribution systems dealing with interface problems)	
1975	Data bases	
		Data processing at **management** level
1979	Management information systems	
1983	Decision systems	Data processing at **execution and management levels**
1986	Expert systems	


Overlapping Technologies

Wagner, 1987, From Data Processing to Office Communications.

The diagrams show that Electronic Data Processing (EDP) related office communication activities have gradually become an integral part of an office worker's job. This is leading to the reduction of unproductive tasks and is creating more scope for office workers in various departments to become involved in creative activities. Access to information is increasing the ability of office workers to manage situations. This in turn means that tasks can be carried out more quickly, leading to an increase in returns on capital investments.

In a series of seminars for trainers held at the Commercial Training Section of the Bfz in Essen, the qualification requirements identified for EDP supported office workers, (which were almost identical to those identified at the Fraunhofer Institute for Microelectronics in Industrial Management), were:

- **Equipment-specific knowledge:** dealing with the design and structure of equipment, knowledge of basic functions, and familiarity with specialist terminology. Advanced knowledge was not seen as required for specialists in Purchasing, Sales, Accounting and other Commercial Management Functions.

- **Information-related knowledge**: Specialists should be aware of the possibilities which EDP and communication technology tools offer outside of their own areas.

A knowledge of programming was not seen to be necessary for commercial employees. However, they should know about the available programmes and how to use them. They also need to have a basic knowledge of information flows against a backdrop of in-house work operations (or EDP organisation).

2.2.3 The Growing Importance of "Key" Qualifications

The following are some of the major aspects of professional competence, under the heading of "Key Qualifications" which commercial workers need to acquire in order to perform effectively in to-day's work environment:

Capacity for associative thought: this refers to the ability to understand the interrelationship of economic, technical, legal, social, and political issues, and to take them into account in one's work.

Independence: this refers to the capacity for autonomous action and the intelligent use of one's freedom ("being enterprising")

Cooperative attitude: Problem and "special " cases frequently can only be solved in cooperation with others, which require communication and team work.

The ability to express oneself: this is gaining in importance because one has to communicate with experts from other disciplines, e.g. specialists from EDP, Production and so on.

Flexibility: this means being able to free oneself from basic "learnt" patterns and adapt to new conditions.

The ability to transfer: this has to do with putting theory into practice, in order to recognise structures and to apply one's knowledge to new situations.

Self-discipline : with electronic mail for example there is no stack of files on the desk reminding one to get down to work.

Willingness to accept criticism: this means accepting justified criticisms, being able to discuss misunderstandings, to distance oneself from one's own work, to recognise the limits of one's own abilities and to admit one's mistakes.

The kind of changes which make it necessary for modern workers to possess the "key qualifications" outlined above, can be explained in relations to the changed situation which workers have to face up to in the future. This is illustrated below:

Examples of Changes in Features of Working Life

Requirement	Past	Now and in the Future
Competence	Based on familiar operations	Recognise new problems and solve them
Responsibility	Discipline	Independence
Technical Education	Completed at beginning of working life	Continuous
Knowledge	Detailed knowledge	"System" knowledge
Decisions	Little freedom	Wide scope
Flexibility	Unchanging work	Constantly changing workplace
Availability of Information	Edited information available	Information must be retrieved
Technology	Tried and tested	Unfamiliar - always developing
Security	Predictable	Uncertain
Emphasis on learning	Learning facts	Learning structures and transferring them to new situations

"Key Qualifications" cannot be developed along traditional teaching lines, but rather through learning processes which simulate real life working situations. This means that trainees/workers are allowed to take responsibility for their own work and learning. To make this possible certain conditions must exist in the work place or training centre. These are listed below:

Learning Activity of Trainee/Worker	**Conditions at the Workplace or Training Centre**
Assumes responsibility for the learning process and results	Freedom of scope, confidence in those who learn.
Obtains the necessary information from books, technical magazines, work documents, and from colleagues and superiors.	Books and magazines must be available at the work place/place of learning. Superiors and colleagues must pass on information and have time for discussions with colleagues and trainees.
Asks precise questions in order to understand a context related matter.	Qualified superiors and colleagues who know how to explain things.
Determines whether contents must be learnt by heart or whether understanding is required.	Time available to make decisions and to achieve goals.
Differentiates between and uses various learning techniques	Trainers and employees are made aware of various learning techniques.
Realises that difficulties in learning and understanding are not related entirely to one's own abilities.	Willingness to talk about difficulties in understanding and learning - methods and conditions are adapted, as far as possible.
Maintains self-confidence even in difficult situations.	Positive reinforcement by trainers, superiors, and colleagues.
Analyses situations, spotting problems, sees relationships.	Freedom of scope - no petty or over-protective supervision.

3. Human Factors in the Design of the Workplace

3.1. Human Factors in the Design of the Technical Workplace

In the past, factories produced standardised goods in vast quantities. Over recent years however competition at national and international levels has become more and more intensive. The necessity to meet customer requirements led to the introduction of flexible and cost effective production methods. such as automated systems, which were capable of producing smaller batches, cutting down delivery times, and adapted to customers' quality requirements (Bullinger, 1985). In this context the workforce was often seen as a cost factor and as a source of defects.

Today however, company managers are beginning to recognise that human creativity is required to cope with the unexpected problems which arise. A specialised workforce is required to deal with the unique situations which a computer cannot be programmed to resolve. Because of the fact also that components from a wide range of suppliers are used, it is also necessary that employees be familiar with many technologies and different automation systems.

The need to network individual machines, equipment and facilities means that there is a growing demand for suitably highly qualified workers, while routine activities ("left-over jobs") are tending to be rationalised. In order to undertake a variety of functions, a **team of workers** with different qualifications, operating with a great degree of autonomy, is proving to be an effective strategy.

As a consequence the organisation of work is changing dramatically and classical boundaries are disappearing. The trend is towards networking systems which previously were not integrated. An example of this is the Computer Integrated Manufacturing system, which so far have been implemented mainly in larger companies, such as in aircraft and machine construction, and the automotive and electrical industries. The development of appropriate low-cost systems for medium-sized and small companies has not taken place, to any great extent, up to the present time.

3.2 Human Factors in the Design of the Commercial Workplace

3.2.1. New Organisational Structures

The coming together of different functions in the commercial workplace is leading to more integrated organisational patterns such as:

- ***Reverse delegation:*** Superiors and specialist workers do their own word processing, they write calculation programmes themselves and are responsible for electronic filing and file-searches using data management systems.

- ***Re-integration:*** office support work such as typing and secretarial work is combined with higher-order skill work. A business operation is no longer dispersed over a whole range of different workplaces, instead all relevant information is available at one place. In addition, there is a new form of cooperation doing away with the traditional split between commercial and production sections. Commercial workers, technicians and industrial specialists work in a team to solve a company problem, using the same data, and learning from each other.

- ***Horizontal integration:*** Integrated task processing leads to horizontal customer-oriented organisational models.

3.2.2. Changes at Specialist Level

The problems which confront specialist workers are as follows:

- Fear of the unknown: Fear of not being able to meet new demands;
- The desire to hold on to those things with which they are familiar;
- Reliance on established patterns;
- Lack of confidence in superiors who do not answer all the questions;
- An emotional resistance to change.

3.2.3. Changes Required at Management Level

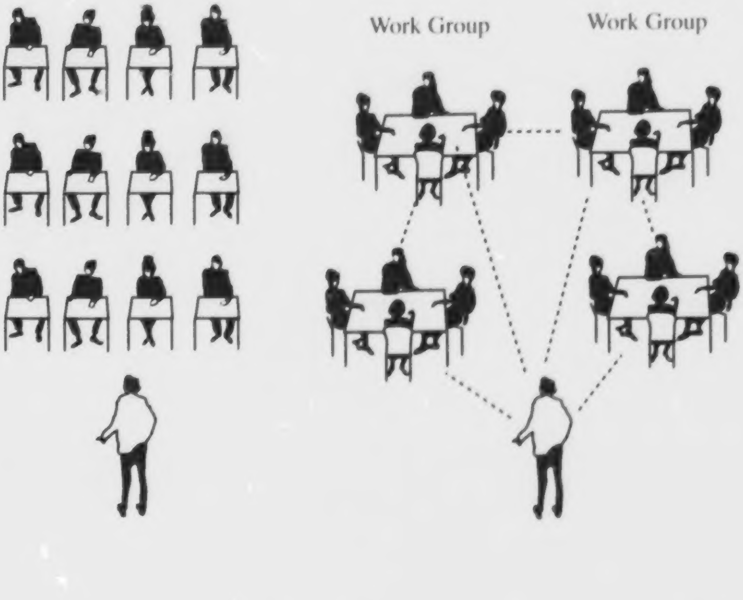
To deal with these issues, a corporate philosophy needs to be developed and applied throughout the whole company. Management must be open to learning and change, and create an environment in which autonomous learning is fostered. In the future, the task of managers will be far less technical, as they will be expected to act as coordinators, and as trainers in relation to specialist and "key qualifications".

4. Design of Training and Learning

4.1. Design of Learning in Practice

When selecting learning activities, a trainer must bear in mind that his/her primary task is to awaken self-confidence in the learner. This does not mean leaving the learners to their own devices, but rather establishing a correct balance between directed and non-directed training. In the final analysis it is the learners themselves who determine the learning process. The trainer's job is that of a moderator and coordinator.

The diagram below contrasts the traditional didactical approach with the new "learner centred" task oriented problem solving approach.



Traditional Didactical Approach

Learner Centered and Task Oriented Approach

The Curriculum therefore must be structured in such a way that it supports group work, project work and a large scale of interactivity between the learners. They should be given ample time to work things out by themselves, learning through their mistakes and checking solutions with one another.

4.2. Design of Training and Learning in the Technical Sphere

The research project "Basic Interdisciplinary Professional Qualifications in the Field of Microcomputer Technology" (BBM) at the Bfz, Essen, led to the development of suitable teaching materials in Informatics-related basic training. More than 300 learners participated in this project, as well as trainers and teachers from the industrial and scientific fields.

The application fields covered were as follows :

- general control technology
- computer-aided gauging, control and management
- data transfer/control technology

Teaching modules, written materials in modular form, and didactic/methodological instructions for trainers were developed. These were then tested by means of weekly seminars. Through using a number of exercises which varied in degree of difficulty, it was possible to design a learning process with large amounts of differentiation. The educational model used enabled a rapid introduction to the world of "information technology" to take place. Participants were able to learn by means of their own planning, experimentation, checking and appraisal.

With the trainers acting as advisers and moderators, it was possible for the course participants to be directly involved in the design of the learning process. The greater part of the seminars consisted of small groups, (two to three persons), working together.

4.3. Design of Training and Learning in the Commercial Sphere

At the Bfz in Essen, the project group dealing with "New Technologies in Commercial Training and Retraining" (NTK) developed learning approaches to meet the new needs of Commercial Workers (Langenbeck, 1988), in which the participants learned through working on real commercial problems.

The courses started with a complex task in the shape of a case study which crossed technical disciplines. The learners had to identify the problems, structure them and deal with them in a decision-oriented manner. The case study formed the basis for the connection of three elements:

1) commercial knowledge and skills,

2) informatics, and

3) "key qualifications".

Access to modern communication equipment enabled the trainees to obtain further information. Course participants learned about the advantages and disadvantages of the different systems. The possibility to survey employees in the administration section of the Bfz, and to question specialist employees in enterprises, completed the picture, and served to integrate company peculiarities in the learning process. A reference library in the class room was a further supplement to the "information market". Course members solved all the tasks autonomously and the learning site was virtually the same as the workplace.

The experiences of the NTK team showed that learners were able to control their work themselves. Mistakes were spotted and corrected by referring to the available literature, through discussions within the group, and by making comparisons with the results of other workgroups. In some cases course participants compiled their own check lists, which they later used to control their results.

Initially the learners were afraid of not being able to cope with the "new" style of learning, and they questioned the effectiveness of self-controlled learning. Open-ended tasks were confusing for those who were used to the one "correct" answer. To deal with this, an induction phase was implemented in which the reason for the new methodology was explained, and trainees were given work dossiers on the various professional jobs in the commercial sphere. This enabled them to see the goals they needed to attain and to understand the learning process they needed to go through to attain them.

Special emphasis was placed on different forms of group work. The introductory sessions, which lasted for ten minutes, were the only ones which were trainer-centred or structured along frontal teaching lines. Group work tended to draw out the individual members and gave them opportunities to learn with, and from each other, through exchanging ideas and presenting the results of their work.

Section Four

Organisational and Management Issues

Chapter 11

The Need for Self-Learning Organisations as part of an Overall Business/Management Strategy

Mike Pedler

Introduction

For many organisations Business Strategy means looking at what your competitors are doing and imitating them. In today's rapidly moving markets•this is like photographing a moving car - by the time you have analysed and implemented the data the car is miles away. This is the game of "catch up" and you never do. The essence of a good business strategy lies in creating tomorrow's new opportunities and advantages as well as continuing to deliver today's products and services, and doing this at a rate which is at least as fast as the rest of the market: to quote a recent paper on Business Strategy - "an organisation's capacity to improve existing skills and to learn new ones is the most defensible competitive strategy of all ". (Hamel & Prahalad p.69)

This capacity to learn is at the centre of an emerging model of organisation which I call a Learning Company. **A Learning Company is an organisation which facilities the learning of all its members and continuously transforms itself in order to achieve its strategic aims.** At the level of the individual this embraces the idea of "Self Learning Competency" (Nyhan 1989) but a Learning Company also seeks to create and maintain a collective self-learning capacity. It is this consideration of the organism as a whole, as a learning organisation, which poses the most compelling problem of the moment.

It needs to be said here that, in one sense, there is no such thing as a Learning Company. I can not take you out and show you one. It is not even possible to name this or that organisation. There are two reasons for this. The first is simply that it is a very new idea and only just entering the currency - in 5 years time however there will be plenty of businesses calling themselves Learning Companies.

The second reason is more important. A Learning Company is an idea or metaphor which can serve as a "**guiding star**", leading us where we may want to go. It can help people to think and act together in relation to the future. Like all visions it can help create the conditions through which some of the features of a Learning Company could be brought about. Therefore it is not a concrete entity but a theory. In Gergen's (1978) terms it is a "generative theory", that is, one which mobilises energy to shape shared perceptions and the will to change, as well as leading to concrete action. Such a theory encourages people to create their own "vision in action" and not to imitate that of others. For this reason we should resist calling any actual organisation a "Learning Company". We can say that this company or that organisation has certain features of a Learning Company, but that is as far as I would want to go.

In this paper I present a case for the Learning Company and a description of some of what may be its characteristic features. This is based on continuing research which I am doing with my colleagues John Burgoyne and Tom Boydell. Our picture of the Learning Company, which is culled from the literature and from our emerging experience with different types of organisations mainly in the UK, is changing all the time. The model here is different from the way I envisioned it earlier. That seems right and proper, for we are dealing with a shifting phenomenon. I illustrate the model with some case examples, most of which are taken from actual practice in organisations.

The Case for the Learning Company

There is a massive underdeveloped potential in most organisations. The ability to transform this potential in all aspects of company operations could result in extraordinary profits growth, great improvements in the quality of service or dramatic increases in morale and motivation. The desire for this sort of transformation should be central to business strategy. Most organisations are geared to incremental rather than transformational growth and change. For example many companies measure success in one or all of the following three ways:

- against last year's performance
- against last year's budget
- against their competitors' performance

These comparisons are historical and generally do not look to the future. As habitual reflexes, they tend to perpetuate average performance and to buttress the status quo. The right comparison is against that which is possible. Current performance may look good against the average, but what could it be like? What is our potential together which we could realise? What is going on out there that we could work with? How can we work together differently?

These are the sort of questions asked in a Learning Company. The best way of keeping up with the business is enhancing the learning capacity of both individuals and the organisation as a whole. The need to adopt Learning Company strategies comes both from environmental pressures without, and from people's natural personal striving for example:

- the decline in the birth rate reducing home markets and labour supply
- internationalisation of trade creating European and global markets with exposure to increased competition, low cost producers and so on
- managers becoming better trained and more sophisticated

For public sector and non-profit organisations times are also increasingly hard. They have felt some of the above pressures whilst experiencing:

- increased demand for services with decreasing government funding
- a severe crisis of confidence due to "privatisation" and the undervaluing of the idea of "public service"
- low morale due to staff cuts and relatively low earnings

But the fundamental problem is the same as for those in the commercial world- how to let go of old ways of thinking and managing, and embrace the new imperatives whilst preserving and enhancing what is good and enduring. This means fundamental, and not superficial, changes; what Argyris & Schön (1978) have called "double loop" as opposed to "single loop" learning. Single loop learning involves making small, incremental changes in existing systems and gradual improvements in efficiency. Double loop learning is about making major changes in values, assumptions, goals and operating procedures; in short, transforming the old to create a new organisation.

A Picture of the Learning Company

Figure 1 depicts some of those characteristics which we see as typifying the Learning Company. Fundamental to these is that the organisation "sees itself" not just as interactive with, but as a co-producer of its environment. Of relevance here is the idea of the self-producing organisation which it is not seen as separate from, but as a part of, its environment (Morgan 1986, pp 240-245). An example which illustrates this a small hand-tool making company, which places great store by invention and product quality, but neglects marketing. It loves making tools but is afraid of selling to anyone, except long-established customers. The company senses increased competition, and fears what it will find should it research the market. Its thoughts and feelings are helping to create an unfriendly environment.

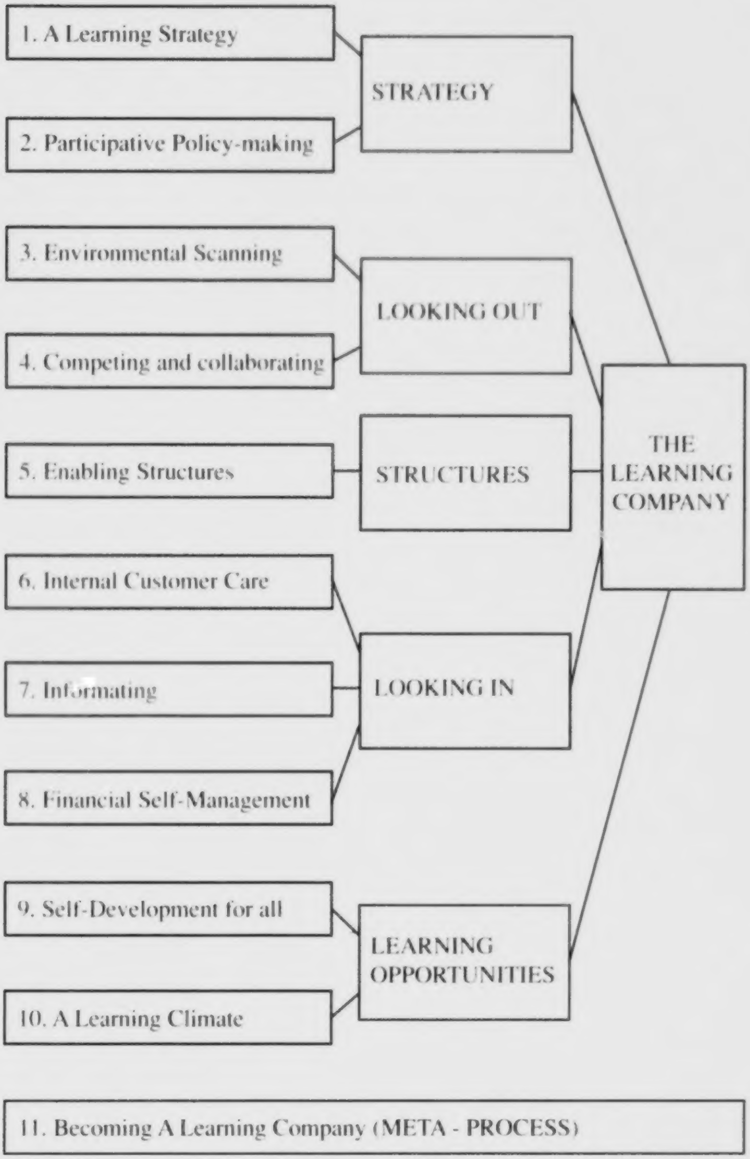

1. A Learning Strategy
2. Participative Policy-making
STRATEGY
3. Environmental Scanning
4. Competing and collaborating
LOOKING OUT
5. Enabling Structures
STRUCTURES
THE LEARNING COMPANY
6. Internal Customer Care
7. Informating
8. Financial Self-Management
LOOKING IN
9. Self-Development for all
10. A Learning Climate
LEARNING OPPORTUNITIES
11. Becoming A Learning Company (META - PROCESS)

Figure 1: A Picture of the Learning Company

Another simple example is the large concern which has so embraced the language of "hypercompetition", and is so committed to competitor analysis and competitive advantage, that it helps create an environment in which there is no alternative to endless warfare.

The processes of looking in and out are fundamental to the Learning Company; they are part of the same whole. The job of senior managers is to ensure that attention flows round the inner and outer aspects as in Figure 2: Looking In and Looking Out.

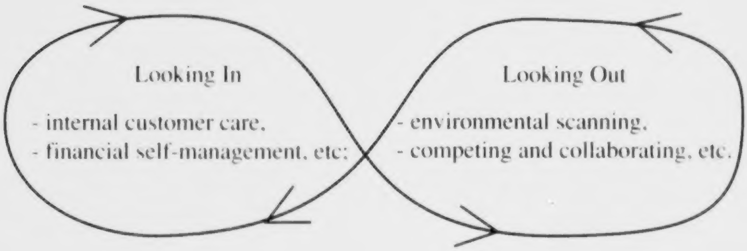

Looking In
- internal customer care,
- financial self-management, etc;
Looking Out
- environmental scanning,
- competing and collaborating, etc.

Figure 2 : Looking In and Looking Out.

These twin processes are managed within the context of three others - strategy, structures and learning opportunities. Over and above these is the meta-process of becoming a Learning Company, including the vision and the continuing will and effort to enact it.

Characteristics of the Learning Company

In seeking to become a Learning Company, any organisation could test itself against the eleven dimensions of the model in Figure 1.

A Learning Strategy is not a "right-first-time" or "Charge of the Light Brigade" approach, but one which allows business plans to be developed and formulated "as one goes along". To do this, managerial acts should be seen as experiments and not as solutions. Deliberate small scale experiments and feedback loops are built into plans so they can be continuously improved in the light of experience.

In "**Participative Policy-Making**" the debate over company business goals is widely shared. All members have a chance to discuss and contribute to major policy decisions. There is a deliberate fostering and encouragement of creative contributions and a recognition that debate involves conflict between different positions and views. There is a belief that airing differences and working through conflicts is the way to reaching business decisions to which all members are likely to be committed.

One way of structuring the debate so that different views are sought within a process which channels the conflict, is described in Box 1 :

Box 1

Learning From Dialetic

Many managerial problems turn out to be messy and poorly defined. It is sometimes hard to tell the problem from the symptoms, or to choose the relevant information from the vast amount available. Matters seem to be full of contradictions and paradoxes. There are different values amongst members which lead to political and emotional clashes.

The stresses in managing ambiguous situations can be enormous. In such situations we are tempted to go for "quick fixes" or to contain the conflict and mess in some way - often for the sake of our own comfort or health. Learning Companies have to do better than this. Conflict is stressful but it also is a source of creativity, of testing old ideas and generating new ones. An organisation which structures out conflict will also cut out challenge, risk, creativity and learning.

Here is one way, using three groups taken from the organisation, to conduct a dialectic in order to try to get the benefits of conflict without the destruction.

1. Three groups, A, B, & C are set up to tackle an agreed problem area. The most senior person is put in Group C.

2. Group A goes off and develops an analysis and a plan for action on the problem using any agreed method.

3. A's list of key assumptions is then turned over to Group B which has the job of preparing counter-assumptions and an antithesis to A's plan.

4. Next, group C facilitates a structured debate. A & B take turns to give spirited presentations, outlining their assumptions and the key data which they consider of importance. Each then probes the weaknesses in each other's plans using wit and humor as well as logic and analysis. A sense of the dramatic is helpful here. The facilitators must work to balance combativeness with goodwill and prevent personal attacks. The rest of Group C note significant points and omissions.

5. Once the arguments begin to be repeated, the facilitator ends the debate and calls a break for members to socialise and re-connect at the personal level.

6. Then the whole conference, led by members of Group C, generates a list of agreed assumptions, a set of key data and a plan for action. -

This approach can surface existing differences, tensions and values. The clash of views can create something new - a third position from the opposing two - which may possess aspects of both together with higher validity or acceptability than either. It is a good way to test a plan and a method for involving more people and more parts of the organisation in policy making.

(Source: Michael McCaskey (1988) "The Challenge of Managing Ambiguity and Change" in Pondy, Boland & Thomas (Eds.) Managing Ambiguity and Change, Wiley, Chichester, UK, pp 1-15.)

Environmental Scanning is the essential first step in "Looking Out". It is carried out by all members who have contact with customers, clients and other stakeholders external to the organisation. These "boundary workers" deliver goods and services and systematically collect and carry back information which is collated and disseminated. There are clear opportunities for customers, suppliers and stakeholders to raise questions, give feedback and make requests to the company.

The Learning Company is always on the look-out for new possibilities with customers, clients and even competitors. The company shares information and collaborates with stakeholders on joint research and development activities. There is the ability at all levels within the organisation both to **Compete and Collaborate** as the need and opportunity arises.

Enabling Structures are those which create opportunities for individual and business development. Roles are loosely structured to allow for personal growth and experimentation. Departmental and other boundaries are seen as temporary structures which can flex in response to environmental or other changes. The aim is to create an organisational architecture which gives space and headroom for growth, now, and in response to future challenges.

Internal Customer Care involves all internal units and departments seeing themselves as customers and suppliers, contracting with one another in a partly regulated market economy. Individuals, groups, departments and divisions exchange information on expectations and give feedback on goods or services received in order to improve the quality of relationships. Management facilitates and coordinates; control is achieved through negotiation and mutual adjustments between units.

Informating describes that state of affairs where information technology is used not just to automate, that is to take out the element of human intelligence, but to inform and empower people to ask questions and take decisions based an available data. Informating systems are designed to provide members with access to all relevant information on the company in order to speed decision making. Information technology and public domain databases give control to front line workers who can "interrogate" them for information. Information systems are designed to encourage learning and are interesting and even fun to use. Box 2 gives an illustration of how informating is changing the way things are done :

Box 2

Working In The Electronic Learning Net

(Computer Mediated Informations Systems (CMCS) exploit the storage, processing and retrieval capabilities of the Company mainframe for internal and external communications. Databases, texts, articles, reports, manuals, directories etc. can be held for quick and easy access by members. Communications software including Email, Bulletin Boards and Conferencing allows for interaction between members, both person-to-person and amongst dispersed groups. CMCS provides an electric learning environment where all members have equal access to data and are able to communicate freely.

Any member can take part and all the Company's PCs are networked through the mainframe with relevant external systems. This remote access to national and international knowledge networks is available within the company at any time.CMCS is increasingly being used to deliver all kinds of education and training programmes in which users typically report higher levels of interest, involvement and personal control than with conventional delivery methods.CMCS also provide for the distributed knowledge networks which are at the heart of up-to-date Professional practice.

Helen Jones works for a large international firm of Consulting Engineers as an internal management adviser. She is currently involved with an project team which is designing and building an integrated Steel plant in the USSR.

As part of her work with the project team Helen puts out regular progress reports on the project on the internal network Bulletin Board. On arriving at work on Monday she finds various EMail items from the weekend. One is from a manager in New Product Development asking for details on the project planning methods being used. Another is a request from an engineer for a short attachment for personal learning purposes with the project team. Whilst printing these for presentation to the team later in the week, Helen sends an urgent request to Finance for clarification of a budgetary procedure being used on the Steel project.

Helen also belongs to a professional association and has been taking part in an on-line seminar on new organisational structures. This morning she logs into the seminar and finds that since she last took part, several members have been exchanging ideas about "temporary structures" and "opportunity structures". After scanning the summaries she downloads the texts for later study. Meanwhile she makes some notes and prepares some questions to add to the discussion section of the conference later on. She then logs in to the Papernet held by her association to see whether there are any items relevant to the Steel Plant project. She notes the names and numbers of two members offering papers on Project Management and Cross-cultural Issues. Finally, before going to a 10:00 a.m. meeting she sends travel warrant requests and last month's expenses through to the relevant sections via EMail.

Returning some two hours later, Helen deals with a query about her travel requirements before logging-on again, and instructing her PC to send the previously noted comments to the Organisational Structures Conference, and to send requests for the Papernet offerings. She has also received an invitation from Vienna to contribute to an electronic journal on "Managing in a Unified Europe" which addresses comparisons and contrasts between western and eastern approaches. She makes notes in her computer diary to remind her to clear some papers on the USSR project with the project team before offering them to the Journal.

(Source: McConnell D & Hodgson V "Computer Mediated Communications Systems (CMCS) - Electronic Networking and Education" Management Education & Development 21(1) Spring 1990)

With **Financial Self-Management** the essential control systems of accounting, budgeting and reporting are structured to assist learning due to the consequences of managerial decisions. Systems promote managerial self-control by encouraging individuals and units to act as small businesses within a regulated environment. The emphasis is upon auditing, controlling and accounting for one's own actions.

Box 3

Accounting Roadshows At Mercian Windows

Following several requests after a series of Customer Care programmes, the Finance Department at Mercian Windows set up a Roadshow to go at fairly short notice to any of the 38 Branch Offices of the company. As an operationally de-centralised but financially centralised organisation, Mercian Windows needed to ensure that Branch management teams understood the way money worked in the company in order to make better business deals and, in particular, to take appropriate risks.

The roadshow consists of the Branch Accountant in Head Office, the Factory Accountant, the Internal Auditor and an attached Management Trainer. The Roadshow includes a video, some short presentations, self-development activities designed to illustrate the workings of the money system and opportunities for personal one-to-one or small group coaching to work through specific issues. In addition, and following a Roadshow visit, Branch managers are encouraged to set up a further learning contract with the Head Office which can involve further study, visits and contacts.

The accounting Roadshow has certainly shown Head Office to be responsive and resulted in some Branch managers being better informed. In a Learning Company we would ask a further question - has it resulted in any changes in the way Finance is done in the Company? The Finance Director was cautious on this point - "It has certainly resulted in changes to the way we present financial information in the company" was as far as he would go.

A good **Learning Climate** means that managers see their primary tasks as facilitating members' experimentation and learning from successes and failures. It is normal to take time out to reflect on practice, and senior managers give a lead in questioning their own actions and in seeking to learn from experience. One way of influencing the Learning climate in a large company is to create a new set of messages about what learning is

Self-Development Opportunities for All means that resources and facilities for self-development are available to all the organisation's members. People are encouraged to take responsibility for their own learning and development. No-one is sent on a course, but members report on their learning activities as a regular aspect of the appraisal process and discuss their further learning needs.

Box 4

The Developing Centre

Alistair Crombie suggests that the cultivation of a Learning Company can be helped by a Centre which promotes enquiry and learning throughout the organisation. The mission of the Centre is not to put on courses (although it might run a few) but to research, animate and facilitate individual and organisational learning. The Centre is autonomous, reports to the CEO, has a committed core team on 3 year contracts and is guided by an advisory board drawn from both inside and outside the organisation.

In Swindon in the UK, Thorn EMI established the Development Centre in 1985 with the mission:

" ... to contribute to the long term competitive advantage of Thorn Home Electronics International Ltd (THEI) businesses through the effective enhancement of individual and collective learning and development".

The Centre's principles include promoting learning as a way of life and addressing the questions of long term cultural change. Clear beliefs underlie these principles. Amongst these is that change starts with the person and that those who prescribe change for others whilst not practising it personally, are unlikely to influence others in developing themselves and the business. At a collective level cultural change is likely to come about if ideas and experience are shared across businesses in Thorn.

Thorn's managers are encouraged to use the Development Centre as a "drop in" - to do some individual work, to bring their people for an "away day" or to talk over business and personal development issues. It took some time to create a healthy relationship between the Centre and its customers. People's expectations sometimes led them to demand courses and programmes and they found it hard to understand why these were not forthcoming.

(Source: Crombie, A., "In Search of the Learning Organisation" Human Futures, Spring 1981).

Becoming a Learning Company requires an overall effort to create, maintain and realise the vision. This is a meta-process which encompasses the other characteristics within the broader and less specific vision. To illustrate just one aspect of this process, a key factor is the Company's ability to challenge itself, to given itself that kick which can stimulate double-loop learning through questioning of current operating norms and assumptions. Some companies have tried to build this in :

Box 5

The Management Challenge

Challenging your own norms and assumptions is difficult. As their names imply, these everyday structures of individual and corporate lives are taken for granted, not noticed - in effect invisible to those who follow or hold them. They are much more obvious to others who follow different norms and assumptions, who whilst similarly blind to their own "taken-for-granteds", can ask penetrating and provoking questions of us.

Royal Dutch Shell has tried to incorporate this potentially valuable process into their company operations with what they call "The Management Challenge". Every three years a senior executive from another plant and usually another country visits a given location to deliver a challenge to management. He or she spends a week or so at the site, wandering around, reading reports, talking to people before challenging the managing team. This involves presenting observations, impressions, making suggestions but, above all, asking "naive" questions - questions which an insider would not ask because the answers are obvious. These questions are basically of the nature - "Why do you do such and such" or "How does this and that contribute to plant efficiency?" The local managers must publish the challenge and their responses to it.

The Management Challenge is one way of ensuring that the "hidden" fundamentals of "how we do things round here" are questioned on a regular basis. Such questioning seems to be an essential component of "double loop learning" or the re-framing essential to organisational transformation. You could institute your own Management Challenge and put in place this vital aspect of organisational learning by inviting different people in, to question your operations. Why not start by inviting fellow managers from a sister plant? If you feel up to being more challenged than this, you could invite a customer, a supplier or a stake-holder from the local community.

(Source: Peter Checkland Seminar, Lancaster 9/2/89)

Chapter 12

The Utilization of Information Technology - A Management Perspective on a Learning Issue

Peter Docherty.

1. Is the potential of information technology being realized?

The information sector is expanding rapidly and is second now only to the energy sector. Information technology is being integrated into most other technologies and into many products. Its integration is giving rise to new professional areas such as telematics, mechatronics and optoelectronics. How is the technology being utilized and what benefits is it bringing? The early applications in the sixties and early seventies were characterized by the automatization of labour-intensive non-skilled work, and brought with them clear and welcome gains in productivity. The picture since the mid-seventies however is not so simple. There are a number of studies from various European countries which indicate that, whilst some groups of users have benefited from the introduction of information technology (IT), many of the benefits acquired by customers, citizens and shareholders have been gained at the expense of the users of the technology, i.e. the employees (Schartum, 1989; Karlsen & Oppen, 1989; Göranzon, 1990). De-skilling has been a frequent consequence.

In Sweden researchers have established that the contribution of IT to productivity improvement in the economy has been steadily decreasing since the mid-seventies (Aberg, 1984). This does not seem to be due to any fall-off in investments or utilization of the technology as such, but rather to the organisational factor - a very poor matching between the technology, the work organization and the skills and competences of the personnel. More recent research in the United States at the MIT failed to identify any contribution of IT investments to productivity improvement at all (Loveman, 1988). The American explanation was essentially the same as the Swedish one - poor matching between the technology and the skills and organisation of the users. There are indications from some recent Swedish work that technology investments may in fact be giving productivity improvements but that there is a timelag between the investments and the harvesting of the improvements of roughly 4-5 years. (Statskontoret, 1989), so long is the informal "trimming" process.

These results indicate the gravity of the problem that EUROTECNET is addressing - poor adjustment between skills and technology is obstructing or delaying industrial and commercial development. The problem can also result from the over-enthusiastic investment in "too sophisticated" technology. It seems weak to explain away the current state of affairs as an unfortunate and widespread oversight. Clearly top management is not sufficiently aware of the nature of the problem and of the essential role it can, and must play in creating prerequisites for line management to deal with this issue. Regarding the technology side of the issue, management has in most cases the choice between accepting or rejecting the vendors products. On the other hand it has far greater discretion regarding the development of its own personnel. How can management approach the learning issue, and what are some of the prerequisites for effective decisions? These questions are addressed in this paper.

2. Learning in the workplace

Pedler (1989) defines a learning company as an organization that facilitates the learning of all its members and continuously transforms itself in order to achieve its strategic aims. The individual employee may be regarded as learning continuously. His or her learning will partly be experiential on-the-job learning, and partly formal in-company training. The latter is in most cases a necessary complement to the former, if an individual's knowledge is to rise beyond simple empirical knowledge to a theoretical knowledge, which will enable a worker to be able to handle situations not encountered before (Rehnström and Uthult, 1987). Companies seem to have great difficulty in giving priority to formal education for personnel at lower levels in the organization (Reutersward, 1983). In many cases this situation is justified by references to "self-learning on-the-job". At worst this may be taken to mean that workers' learning is not supported by specific investments, is not subject to active planning and control and thus is seen by management as the general responsibility of the individual worker. Conscious, formal efforts are necessary on the part of management if the term "self-learning on-the-job" is to be more than a platitude. It should be possible to observe formal differences in the planning, the procedures, the organization and the resource allocation between the training departments in companies that utilize systematically "self-learning" as a personnel development strategy, and those that do not.

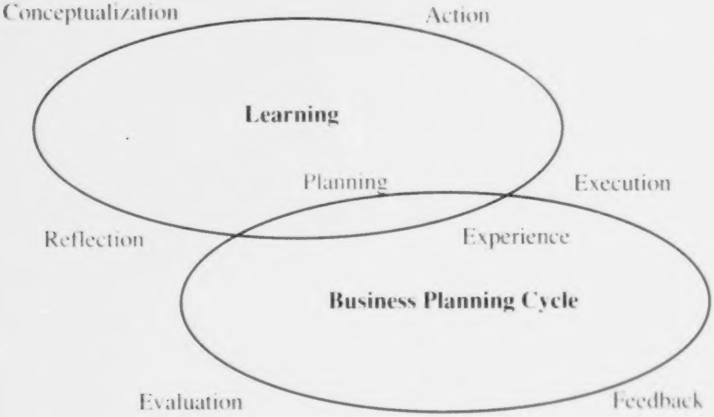


Figure 1 : The stages in an experiential learning cycle are distinctly similar to those in the business planning cycle.

Kolb (1984) has described experiential learning as consisting of four steps: **action** which produces **experience** on which one may **reflect**, leading to new **conceptualizations** and **plans**, which form the basis for **new action**, and so the process continues in further iterations. This simple model has the advantages of providing a clear illustration of both the most common shortcomings of the average employee's work-situation in a learning context, and how this may be improved to facilitate learning. The reward and control systems in most work-situations place a heavy emphasis on production and often do not explicitly include the matter of development. In such situations the worker easily becomes "locked in" to single-loop learning, i.e. the learning cycle becomes restricted to the first two steps - action gives experience which forms the basis for new action, and so on. It is important in this context to point out that such single-loop learning can give rise to intuitive empirical knowledge that may form the basis of a certain level of skilled behaviour that should be distinguished from, and is superior to, simple rule-based behaviour (Rehnström und Utbult, 1987).

The prevalence of single-loop learning in a given situation may also be related to the work organization. Extention of the learning cycle to encompass the steps of reflection and conceptualization may be accomplished by active management decisions regarding organization, technological design and policies. These points will be handled later in the paper.

There are distinct similarities between the learning cycle as described above and the business planning cycle (See figure 1). The two are in fact clearly related, resembling mirror images that may be referred to as the "ying and yang" of business and learning. "Experience" must be accompanied by, or take the form of feedback to the individual worker if learning is to occur in the workplace. The explicit design and implementation of information and performance feedback systems for workers, serve the dual purposes of fulfilling a basic requirement for learning, and of providing a necessary means for workers to plan and follow up their own work. The latter tasks may well be expected to increase the responsibilities, skills and work commitment of the employees as well as the efficiency and flexibility of the organization.

	Everyday Improvement	Major-step Learning
Effects	Long-term and long-lasting, but undramatic	Short-term but dramatic
Pace	Small steps	Big steps
Timeframe	Continuous and incremental	Intermittent and non-incremental
Change in Work situation	Gradual and constant	Abrupt and volatile
Involvement	Everybody	Few select "champions"
Approach	Collectivism, group efforts, systems approach	Rugged individualism, individual ideas and efforts
Mode	Maintenance and improvement	Scrap and rebuild
Spark	Conventional know-how and state-of-the-art	Technological break-throughs, new inventions and theories
Practical Requirements	Little investment but great effort to maintain	Large investment but little effort to maintain
Effort orientation	People	Technology
Evaluation Criteria	Process and efforts for better results	Result for profits

Figure 2: Features of the "Everyday Improvement" and the "Major-step learning" situations (After Imai, 1986).

Management and others often regard learning as a relevant issue when (major) changes in relation to, for example, the business idea or ownership, new product lines or models, new plant or technology investments, new organizational structures and power distributions, or new recruitments are to be introduced. These are examples of changes which may be of a dramatic and far-reaching character, and which require radical shifts in the way people go about their work. Core skills may, for example, become marginal skills overnight. Basic assumptions may have to be reevaluated. A key issue regarding learning in these contexts is whether the change processes themselves are utilized as an opportunity for learning or whether a "training" paradigm prevails.

An essential complement to "major-step" learning is the "everyday improvements" which are of a continuous and incremental nature and concern all personnel. This is an aspect of "learning" that often falls outside the legitimate sphere of influence of training managers, at the same time it is too mundane to attract the attention of line management. It is important to remember that it is this type of learning that is often referred to as the essential "on-the-job" learning. It is also an important part of the broad definition of "rewarding work" or a good work environment (Arbetsmiljofonden, 1984; Svenska Metallindustriarbetarforbundet, 1988). Continual planned learning at work is recommended by the authorities and demanded by the unions. Figure 2 compares some of the features of "major-step" learning and of "everyday improvement". Given that such "on-the-job" learning tends to fall between two chairs, how can steps be taken to establish it ?

3. Management's vital role to create and maintain prerequisites for a self-learning environment.

A self-learning environment does not exist in many companies. Establishing such an environment requires an organizational change, which in this context, also entails learning. Revans, the leading researcher on, and proponent of action learning, refers to the basic role list of the actors who must participate in the change process if it is to succeed. He concludes that it is necessary to involve ***those who can***, ***those who will*** and ***those who care***. Naturally specific individuals may have several roles at the same time in a given situation. Those who can, provide the necessary competences for carrying through the change process. Those who will, are the champions who provide the driving force and source of enthusiasm. Those who care are the clients, sponsors, mentors, who provide the sanction and legitimacy for the changes. Management have key responsibilities here.

The visible, clear and unambiguous manifestation of the priority assigned to, in this case, "self-learning", must be seen and interpreted in a number of prerequisites which management creates and maintains.

If efforts to establish a self-learning environment are not to take the form of isolated undercover or guerrilla operations, or to run the serious risk of encapsulation or "window-dressing", then experiments and development projects at the operational (production) levels in organizations, must be accompanied by parallel efforts at the administrative and top management levels.

Management's General Prerequisites
for a Self-learning Environment

* Organizational Values
* Strategies
* Organization
* Policy Guidelines
* Reward and Control Systems

Figure 3: Factors Which Can Support a Self-Learning Environment

Figure 3 shows several important areas in which management's position will strongly influence the course and probable outcome of efforts to establish a self-learning environment. This list of critical areas is in itself awesome. It indicates that efforts to establish a "self-learning" culture or praxis in an organization, can flounder due to many causes. In the majority of companies many of these factors conducive to, or compatible with self-learning, will already be in place. Thus only a few complementary changes will have to be made to facilitate or ensure its introduction. A second reflection deals with the issue of how "self-learning" can maintain a high or central profile in a change process that may come to encompass many others goals, issues and conditions, as for example, management by objectives, workgroup autonomy and self-management. Is there not a serious risk that "self-learning" will become "lost in the crowd"? Failing to address other issues in advance, or at the same time, will partially or totally obstruct the introduction of "self-learning". How are the factors listed in figure 3 relevant to the establishment of a "self-learning" culture or praxis?

3.1 Organizational values

The character and pace of change processes in companies is clearly affected by the values of top management. It has been shown, for example, that the character and results of system development projects, are formed more by the project managers' interpretations of top management's attitudes to such issues as "user participation" and "rewarding work", than by the project managers' own views on these issues (Hedberg, 1979; Magnusson, 1974).

Examples of important management values are - views concerning: why people work, commit themselves to certain endeavours, take initiatives, or learn. Quite simply, does management regard their personnel in general as interested in, and capable of development? It is not unusual for management to divide personnel into those in whom it will invest, and those less worthwhile investing in. Management's decisions regarding the design of the work organization can be based on different principles. Ford (1987) points out that Western management usually design production organizations on the assumption of the prevalence of the steady state (a smooth production flow), whereas the Japanese focus on the disruption of the steady state (by stoppages, breakdowns, accidents, etc.). These different points of departure lead to radically different decisions regarding manning and competence levels in the work force.

Many managements find the concept of "self-learning" as applied to non-management and non-professional personnel somewhat vague and disquieting. It underlines the employee's personal responsibility for his or her own development. This entails a relinquishement of a key management function, which will only be willingly made, if management believes in the effectiveness of this approach to realize the company's business goals. To date there is little waterproof evidence of this. There are however a number of successful case studies and research papers indicating support for this approach, e.g. that it is needs-related, is a low-cost and low-risk strategy and that it has distinct potential benefits. Two programmatic efforts in this context are the Irish "Shared Learning" programme (1987) and the Swedish "Development Programme on New Technology, Management and Working Life" (1987).

A complement to the delegation of responsibility for "self-learning" is the adaptation of management's means of control of personnel via organisational values. Many managements have realized the benefits of new management control systems which require that personnel understand, accept and relate the business idea of the company to what they do on the job. An explicit learning process results in the workers sharing essential elements of management's values (Aguren, 1990; Björkman et al, 1987; Ranhagen, 1986; Rehnström och Utbult, 1987).

Apart from values, management also influences the progress and outcome of change processes via the organizational climate or the workers' perceived "environmental quality". A number of dimensions have been shown to affect the course of change processes (Berg et al, 1975) such as: readiness for change, independence in work, stress on rules and regulations, openness, management's control practices, and management's stance on personnel issues.

3.2 Strategy Commitments

Much of recent research on strategic planning in general and, more specifically, on IT-strategies has concerned itself with the integration of business and technology planning. All too often strategic planning has been characterized by functional specialization, in which the separate elements proceed relatively independently of each other. Earl (1990) has identified five basic approaches to strategic planning: business driven, technology driven, method driven, administrative and organizational. The last named is the only approach which clearly emphasizes the integration of all the main functional aspects of strategic planning within the top management team. Unfortunately Earl's work, indicates that the idea of a personnel strategy exercising influence on business and technology strategies, is very seldom found. Personnel are usually regarded primarily as a production factor whose rationalization will allow more tangible benefits from technology investment. Other studies corroborate this tendency, if not to the same extent (Docherty et al. 1990).

Other studies indicate that Personnel Departments are making efforts to change from focussing on personnel administration to developing personnel strategies. This can take the form of complementing market strategies with "labour market" strategies. (See figure 4, Hansson, 1988). Malm has pointed out that such personnel strategies are coloured by the general management culture of the company. Thus a closed administrative culture, giving priority to "law and order", emphasizing "formal obedience", will give rise to limited human efforts from "diligent workers" with relative low interest in personal involvement and self-learning. On the other hand companies with an open change-oriented culture characterized by communication and delegation, will promote "personal learning", personal contracts developing an "invisible contract" with the company, and the release of human energy through competent, autonomous contributions from individual workers.

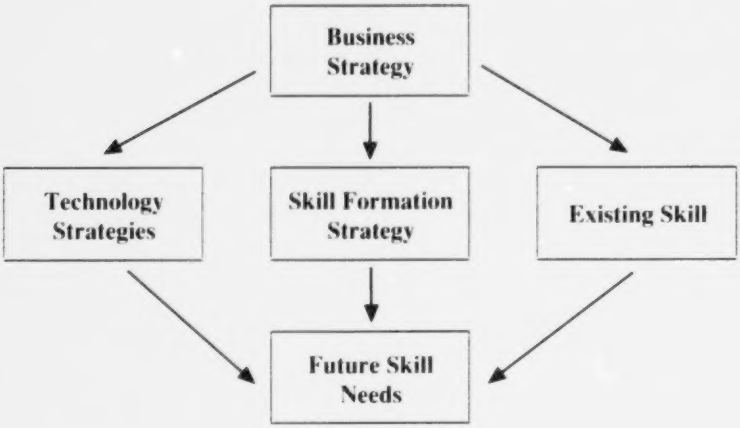


Figure 4 : Labour market strategy complements the market strategy.

The approach to skills development varies from country to country. For example recent OECD studies differentiated three broad strategies. The first, which characterized the major Japanese manufacturing companies, called the Human Resource Intensive Strategy, entails recruiting personnel with high skill levels and investing highly in "the individual". The second, the Polarization Strategy, entails the parallel pursuit of two personnel strategies directed at different sectors of the company's employees. The first focuses on the skilled and professional employees, as the object of extensive development investment. The other dealing primarily with semi-skilled and unskilled workers, sees them as requiring necessary basic training but also the object of rationalization efforts. The third, more prevalent in the Anglo-Saxon countries, is the Mobility strategy. This entails recruiting personnel with high skill levels but relying on the market and the individual to exhibit initiative and flexibility. Reward systems, for example, promote an efficient flow of competence to and from the organization.

Related to the notion of strategic commitment are the concepts of Visions, Symbols and Metaphors. Pedler (1989) underlines the concept of the Learning Company as a Methaphor - which can serve as a "guiding star" indicating where the company may want to go. It can help people to think and act together. He sees the learning organization not so much as an entity, but as a "generative theory", mobilizing energy to shape shared perceptions and the will to change, as well as leading to concrete action.

A good example of a company symbol for competence development is the "Competence Hand" used for example by the Volvo corporation. The hand symbolizes energy, foresight, leadership and a holistic understanding, while the fingers and thumb represent Values, Contacts, Experiences, Practical Attainments and Knowledge.

3.3. Specific Structures.

The specific structures created by management to support and facilitate the establishment and maintenance of self-learning in the company are of critical importance. They are formal, tangible manifestations of management's position regarding such questions as the ownership, legitimacy, importance of, and responsibility for self-learning. They express lines of communication and command, and encompass mechanisms for the resolution of conflict. Depending on the degree of innovation and rethinking entailed in the company, it may be of major importance that the organization of the change process itself has considerable robustness to withstand the forces of dynamic conservatism (cf. Schön, 1971; Lyons and Gillespie, 1989).

Figure 5 illustrates two dimensions of a change process which influence the possibilities of learning. The figure includes examples illustrating changes under each set of conditions. The establishment of a self-learning culture requires that all the personnel concerned should be involved. Pedler also emphasizes the participative policy-making feature of learning organizations.

Those responsible for the change	**The extent of the change**	
	Incremental Improvements	**Major Steps**
Top management and its experts	Traditional rationalization	Installation of an organization or technology
All the personnel concerned	Learning strategy for everyday improvement	Re-interpretation and generation of local theories

Figure 5: Dimensions of the change process that influence the possibilities of learning

A joint forum for development issues.

Individual learning is most often personal and private. The efficiency of the group and organizational learning process in a company is heightened by the setting up of a specific organizational body, a development forum or committee, responsible for the initiation of new development activities for the systematic observation of, and reflection on, change processes, and for the formulation of lessons to be drawn and the decisions to be recommended. This can apply to both "major-step" learning and everyday improvements. Both functions may well be dealt with in the same forum.

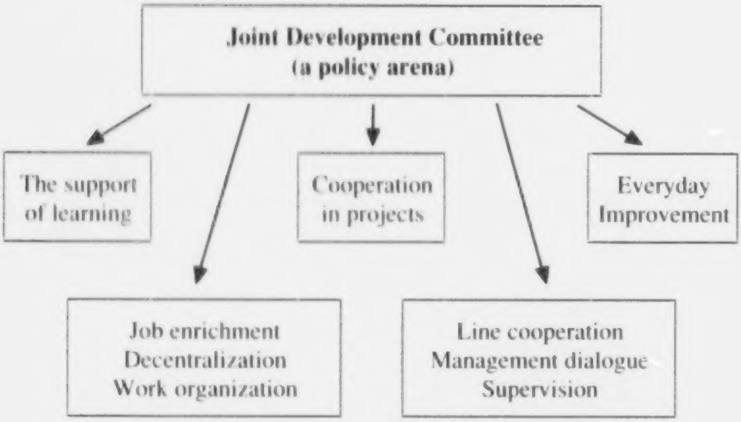


Figure 6: The Joint Development Committee.

A model for the creation of a dynamic organization with a high state of readiness to deal with a changing and complex environment has evolved in recent years and has been tested in several contexts, e.g. in the Volvo Corporation. It is a two level model. At the central level there is a joint management - union committee and this is linked to five processes at the local level. (See Figure 6). The policy arena, "Development Committee" ("Cooperation Committee"), may discuss, a wide range of topics such as the company's situation, external and internal conditions, visions of the future. This creates, amongst other things, a heightened consciousness that "renewal" is an ever-present need. This contributes to the development of a state of readiness so that urgent issues have a chance of being perceived before they become acute. The group's composition allows issues to be handled from many perspectives. The chance of checking ideas within individual stakeholder groups is also increased.

The most important function of such a group is to evolve a policy for development activities in the organization. This policy gives clear indications as to what are the important issues for the company, what measures are desirable, and it provides a benchmark for the evaluation of current activities and indicates opportunities for new initiatives.

Development in an organization covers many issues - training, technical installations, personnel policy, organizational change and new reward and control systems. The committee provides a coordinating mechanism with commonly accepted values and goals. This enables both a high level of integration and a decentralization within broad fields of action. The support of the committee may well encourage individuals and projects to be more bold in testing ideas that deviate from current practice.

The forum can support the entire learning process, including monitoring new ideas from visiting experts, study visits, conference participation, etc.

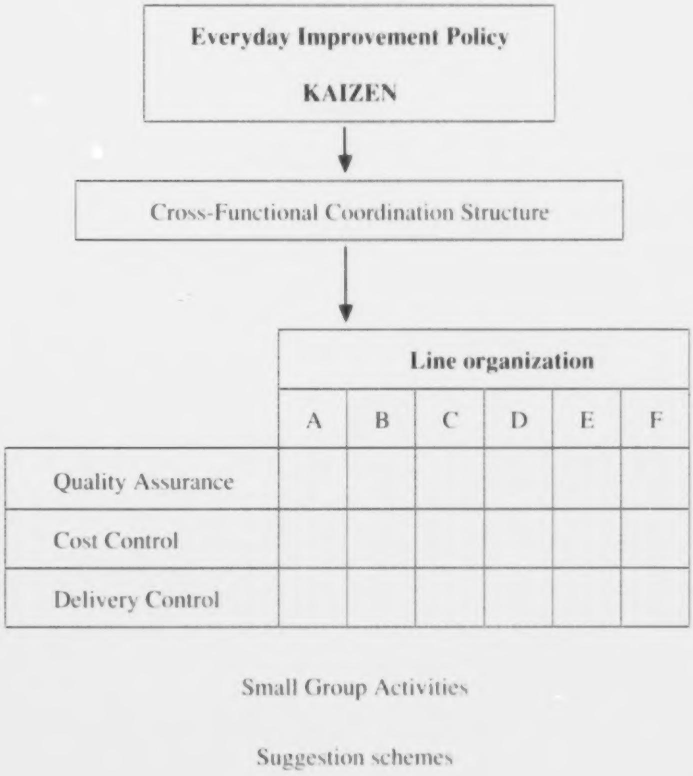


Figure 8: "Kaizen" Management For Everyday Improvements.

Everyday improvements also require organisation if they are to receive constant priority and specific attention. Experience has shown that it is far more difficult to muster the stamina and patience required to carry through long-drawn-out and undramatic endeavours as compared to the glamorous "great leap forward". Indeed there is much in our culture which lauds the "Quick Fix". Western managers often have difficulty in accepting Japanese comments on the Quality Circle (QC) movement such as : "it is the first twenty years that are the most difficult in getting them to function". The comment reflects important attitudes, namely that the basic idea with such a movement is not product improvement but the development of personnel's attitudes and competences. This obviously means a long term view.

With reference to Figure 2, "Everyday Improvement" must be clearly anchored in the management philosophy and the corporate culture. In major Japanese companies this is taken to cover all employees. Every level and every personnel category is given specific roles to play. The activities are planned and controlled within the framework of specific goals, policies and organisations for important strategic cross-functional themes such as Quality, Cost Control and Scheduling. Figure 8 is an example from Toyota of its "Total Quality Control" organization. The cross-functional coordination, via the total quality control committee and its subordinate committees for quality assurance, cost control and scheduling/delivery control, aim to facilitate communication over departmental and functional boundaries, to reduce tendencies towards sub-optimization, and to enhance the understanding of others' positions. The cross-functional committee coordinates the activities in the separate line departments. Each line unit is responsible for organizing its own small group activities, such as quality circles and organizing suggestion activities at an individual level. At the production level there is a need for a local organization to support learning. This point is taken up later in this paper.

3.4 Reward and control systems

Several of the points made earlier touch on the issues of reward and control systems. One of the principle shifts to be noted in the Swedish context, is the trend towards reformulating business goals in terms that are relevant and applicable to the individual worker's control span, and his or her own efforts in production. This requires, amongst other things, specifically directed educational activities to train the workers in such subjects as production planning and capital rationalization. It also requires the development of the information systems available to the workers in production. These systems provide the essential feedback for the workers to be able to take responsibility for their own learning. Given such tools, the workers have little difficulty in showing their entrepreneurial abilities. Naturally it is essential that the new systems are "work feedback systems" and not simply more sophisticated means of monitoring the workers. (Worker monitoring at present seems to be a major concern for American applied psychologists!) Another aspect of the feedback and learning climate, is the toleration of mistakes, and the patience and trust to abstain from immediate interference at the first deviation from agreed plans.

Management in a number of companies is trying to establish personal contracts with its production personnel, which will regulate the relationships between each employee and the employer. This is an attempt by employers to reduce the uncertainty in their environment and to increase the involvement of the worker in the workplace. This "psychological", legal and economic contract is, in many cases, being seasoned with various schemes giving the workers a share in the development of the company. It is important that as the workers are provided with new responsibilities, possibilities for learning, new forms of feedback and new reward (payment) systems, that all the interdependent systems are changed at the same time, and that the various systems are congruent. It is not uncommon for contradictions to arise; e.g.in one case, workers were trained and made responsible for capital rationalization in production, while at the same time they were being paid according to a straight piece-rate system.

3.5 The provision of guide lines for line managers.

General lessons gleaned from experiences to date cannot be reduced to simple checklists, though there is some advantage in attempting to formulate them in terms of a number of recommendations. These do not then constitute a "do-it-yourself" handbook. On the contrary many of the recommendations may well be understood in the context of an illustrative case study.

Given that self-learning is so rarely seen as a stable feature of work situations, efforts to establish self-learning will involve distinct elements of what I have called organizational change or development, major-step learning and everyday improvement. One important recommendation is, that a company should engage in a development programme that encompasses many complementary parallel projects or experiments at different levels in the organization. This is both a question of generating a visible climate of a management "turnaround", creating a "critical mass" in the process, providing the organization and many of its members with new experiences and a chance of personal involvement, as well as engaging the conservative forces on a wide front, and thus reducing the vulnerability of the overall program resulting from the failure of individual projects. A broad programme also can provide individuals with several alternative parallel learning opportunities.

Management at all levels should not simply express a vague support for the programme and then expect to function as sleeping partners, but rather underline its ownership of the programme, and provide an active support within the framework of a system established especially for the purpose. This organization should involve "vertical slices" in the organization so that no level in the hierarchy becomes short-circuited. The establishment of the vertical dialogue confirms legitimacy and provides the opportunity for joint learning across hierarchical levels. This means that management in fact becomes part of the self-learning organization.

Top management must function both as a sender of visions, goals, advice, support and encouragement, and not simply as a controller, monitoring and policing its subordinates, or only making contact with them when some negative deviation from agreed plans has occurred. Regarding the management chain as a whole, this "linking-pin" communication structure should offer the opportunity for managers at each level to fulfil mentoring and coaching roles in relation to subordinates. These roles are probably most essential for first-line supervisors.

Key projects in the programme should be assigned to "champions" or enthusiasts who are convinced of the value of the "self-learning" concept. This approach should not however be accorded too much reliance. "Champions" constitute a necessary but not sufficient condition for success.

A steady pace should be maintained in the projects in order to maintain involvement. Projects should be broken down into stages not exceeding a year, in order to guarantee the feedback required to allow learning and to maintain enthusiasm.

Learning opportunities should be integrated with the work organisation, e.g. by the formation of production groups that encompass a broad spectrum of tasks, including planning, administrative and maintenance tasks.

Production groups should be given goals that are formulated in business terms, e.g. responsibility for holding the capital tied down in work-in-progress within given limits. Production groups should be provided with relevant and systematic feedback information, provided possibly via personal computers or terminals hooked into production systems. The work organization should also provide arenas and sufficient time for joint reflection by the members of the production group on the feedback provided. Such meetings should take place on a weekly basis at least.

Formal training inputs will depend on the specific situation. They may be expected to cover such topics as: social and cognitive skills, such as the ability to formulate questions, problem-solving and conflict resolution; business skills, such as capital rationalization; tool-orientated knowledge and skills such as EDP-support systems and primary job and task-related knowledge and skills.

Section Five

The Development of European Continuous Learning Systems

Chapter 13

Self-Qualifying Organisations - A Necessity for the Future of Europe

Roger Talpaert

For almost ten years I have been privileged to periodically chair meetings in which a group of human resource managers from 20 large Belgian companies, have exchanged their views. This group, which is called "Laboratoire d'Entreprises", is oriented primarily towards questions of strategy. Furthermore, in the course of the last four or five years, I have being meeting regularly with small groups of human resource managers from about 100 large European companies, in the context of what we have called "A Best Industrial Practice Network".

Throughout the discussions I have often been struck by the extraordinary tension between on the one hand, short term necessities, relevant to unique, concrete situations, and on the other hand, much less concrete, but none the less real, long-term developments which govern them. Any personnel or human resource manager, knows that the essential measures governing the increase in value of human capital such as promotion of "company culture", development of women and men, increasing organisational reliability, can be influenced only over long periods of time. Consequently, what is required is a continuity and a consistency in daily decisions, which may very well be different from, or even opposed to, what the logic of the moment and the concrete situation seems to prescribe.

Thus, by way of example, if one wishes to guide "company culture" in the direction of increased respect for the client, which is the present preoccupation of many banks, then promotion and remuneration policies must reward client-friendly behaviour more so than technical excellence in certain areas, despite any short term problems which may arise.

In my opinion it is critical to think in terms of long term tendencies and the general context. It is necessary to think big, and to think ahead, in such a way that the concrete initiatives take on a significance corresponding to the "profound tendencies" of our turbulent times.

It should be remembered that a future oriented approach is necessary to the precise degree that the changes around us are rapid and profound.

The paradox is that the more rapid and profound the changes, the more difficult it is to say anything meaningful about the future. If I have nonetheless decided to attempt this exercise, it is because I am convinced that the concrete content of what may be predicted is not the most important element. After all, as Bertrand de Jouvenel said: "The future is not fixed; the future is the time for things to be done". On the other hand, what is essential is the awareness and the sense of conviction, that tomorrow will be effectively different from today, which brings me to the first theme I would like to develop.

Some Facts Are Very Hard To Accept

If we still need to be convinced of this, the events of the recent past suffice to do so. For Honecker and his colleagues, it should have been obvious that following the attitude adopted by the Soviet Union, and its knock-on effect throughout the region, the "ancien regime" had become totally untenable. But practically all of them, more or less, waited to be pushed by local pressures, which removed them from their positions of power and control. On a less spectacular but just as real level, in relation to the formation of a new Europe, consider how certain elements by no means the least important ones, have clung stubbornly for years to long defunct notions of national sovereignty. And still closer to home, we are all familiar with the talk about the rapidity of technological progress, the internationalisation of markets, the transformation of men and women through education and information. Likewise we all know that profound changes, in the ways companies operate, will have to follow. But very often, even when a foreseeable change has arrived, it is met with surprise and resistance. We close our eyes to it, we engage in vain combat. This is what Toffler, referred to, many years ago, as "future shock".

By way of illustration, and to get to the heart of the matter, let's take a look at the fact that human resources, to a growing extent, are the driving spirit of the company. Henry Ford said that quite a long time ago. More recently it has become the central thought expressed by executives of all the major companies at the meetings which I have attended, always more or less, with the same arguments, such as - technology is everywhere, and it is there for the taking, but the competence required to control technology is more and more advanced, and thus less and less easily purchased.

Most Human Resources personnel would be in agreement with the thesis so far. In recent times however the argument has been taken a stage further with an assertion which is much more likely to affect our daily life. That is - not only will human resources make the difference, **human resources will have the power**. I quote Frank P. Doyle, Senior Vice-President Corporate Relations Staff, General Electric Company, New York, who said that :

> "A dramatic convergence of forces- demographic, technological, competitive and global, will shift power from employers to employees, from the board rooms to the workplaces, where value is added and wealth is created".

Doyle went on to explain that, during the 1980s, the globalisation of the economy triggered movements of rationalisation and restructuring in America, Japan and Western Europe, which were "top down" movements ("business driven", in his terms). We have in fact seen spectacular examples of this in Europe, intensified even more so by the prospect of the Single Market. On the whole, labour has accepted and understood, or just considered these rationalisations to be inevitable. But now, for the 1990s, in a context of competition imposed by globalisation, which is still just as strong as ever, the power to deal with all this will have another dimension. And I quote again:

> "Power will go to people: power and career security will go to employees with adaptable minds, flexible skills and portable pensions; power and profits will go to companies smart enough to make their workplaces, work practices and training programs the most attractive; power and wealth will go to nations wise enough to invest in their children and schools quickly enough".

The reasons behind this spectacular shift of power are threefold: in the first place, demographic; in the second place, as already mentioned, the fact that technology gives power to the operator; and thirdly, the limitations of the scientific organisation as a productive factor.

Demography

From the middle of the 1990s onwards, the combination of an aging population and a decreasing birth rate is going to make itself felt. The labour market will be out of balance, since there will be too few people to do too many things. Early retirements, (much used and abused in the restructuring of the 80s), and even retirement at 60 or 65 - sacrosanct through that may be - will seem like anachronisms or curious aberrations in five or ten years time. This is one of those almost mathematical facts, whose total consequences are still very difficult to accept at present. We'll come back to this later on when we speak of the myth of employment.

The Knowledge Worker

The second force behind the transfer of power from employer to employee is the fact that knowledge belongs to the operator alone. Faced with tasks demanding more and more sophisticated knowledge, the person , Peter Drucker called the "knowledge worker", will dominate the situation. What counts for him is his work, and not the company he works for.

The Limitations of the Scientific Organisation

Finally, the third cause is that the traditional means of increasing productivity- investment in technology, cost reduction, the so-called "scientific" organisation- all have their limits. What's more, investment in hardware, in machines, in technology, only pay off when appropriate "software" exists. This "software" is human competence, and the will to work. The increased value of human resources in terms both of competence and of motivation, thus become the main source of productive growth. No longer is it a matter of having a good conscience and doing a bit of philanthropy. There is a decisive competitive advantage here for those who know how to grasp it in time.

The Growing Inefficiency of Organisations

Faced with this prospect of a shift of power towards the "bottom", what will become of the average companies and the traditional organisations which are very much alive? This is the second theme I would like to dwell on - the growing inefficiency of organisations. As an introduction I will give a brief historical note.

When the first large-scale industrial enterprises appeared in the 19th Century, the concentration of human resources which they required was arranged on a contractual basis: a simple physical contribution in exchange for a salary. Nonetheless, the power of the contracting parties was utterly disproportionate, and in reality it was hunger and misery which, under the cover of legality, made the absolute power of the capitalist over his workforce possible. This was a sort of return to slavery which led logically to revolt and to the collapse of newly-born industrial companies. But, contrary to what Marx thought, with some reason in his time, this was not an irreversible tendency. Human ingenuity and pioneering tenacity found a way out. In the context of global companies, which are in the process of restructuring themselves, the right of association will triumph and permit a progressive re-establishment of equilibrium between the parties concerned. A true contractual relationship will then be established.

It is at this point that a first paradox appears. The organisation and methods of operation of these industrial, and later commercial and service companies, remain fundamentally patterned on the military-hierarchic-power model, as if there was a common, shared objective or a real coercion to force cohesive action. Consequently, it is not surprising that concern is expressed about whether or not the service provided in return for a salary corresponds to what the company requires. The **problem of control** emerges.

The history of industrial organisations is marked by successive attempts at mastering this growing difficulty. Thus, "scientific organisation" attempted to apply to the complexities of human behaviour, the rational rules which had proved successful in material processes. The necessary human inputs were analysed, and the process was broken down into the simplest possible parts for efficient control. The results of this approach were spectacular, as long as the company primarily needed physical inputs based on simple and unequivocal data.

However, operations to-day are becoming increasingly complex with simple ones being left to the automated machines. Human intervention is therefore reserved for operations which are difficult to programme and control. What is more, the general environment is becoming more and more turbulent and unpredictable, and operations are more difficult to foresee and to programme. This whole development, which is very familiar to us, increases the need for **qualitative inputs**, essentially those of information and competence, at all levels of the organisation. The important point here is that this kind of mental contribution largely escapes control, and makes the organisation dependant on the good will and the loyality of even its most modest personnel.

Furthermore, excessive rationalisation demands a very high price in terms of human dignity and psychological needs, such as the sense of personal accomplishment. The very success of industrialisation, which implies a rise in the standard of living and ever more advanced levels of education and information, at the same time, makes people increasingly critical about the manner in which they are "managed".

As the plan to transpose mechanical rationality on human behaviour failed, a number of alternative ways were explored, more often with very limited success. One of these alternatives was decentralisation and objective-based management. A certain **freedom regarding means**, was thus re-established, and there was an attempt at the dissection of large organisations into smaller units in order to regain some of the advantages of a reduced scale. But this process remained very artificial, since the **objectives were all the more strictly defined and imposed**. To neutralise the effects of decentralisation, there was a general tendency to introduce sets of standards which were ill-adapted to the particular situations of the decentralised units. As always, the same impossible obsession for control dominated.

For some time, the spectacular developments in data processing and computers created the illusion that total centralisation and rigourous control were possible at last. And such is indeed the case, even in the service sector, as long as it's a matter of simple, quantifiable operations. But for unsettled, changing realities it leads inevitably to failure. The most sophisticated data processing systems are worth no more than the data entered. The quality of this data, when it is not routine, is an element almost totally at the mercy of the most humble member of the organisation.

Another alternative method in the quest for control of human resources in the company, has been the attempt to develop a more positive attitude, a more **total involvement** on the part of the individual within the organisation. Many systems and formulas have been proposed and tried to this effect, from the "school of human relations" to "industrial democracy", from the "Y-theory" to the various forms of "operational flexibility". But the effectiveness of many of these commendable and well-intentioned attempts remains very limited- "too little, too late". They may not be entirely useless, but they sidestep the heart of the problem and serve only to mollify and to delay.

The heart of the problem is that the **objectives and choices implied by any human collective action, on the scale and level of complexity demanded by the formation of modern companies, cannot be predetermined,** unless they result from a powerful common impulse or pitiless coercion. Both of these are unthinkable throughout the industrial, commercial and administrative sectors of our society. Consequently, the traditional hierarchic organisations, even when "remodelled", cannot even hope to get close to the optimal combinations of means and resources which constitute their raison d'être.

In other words, as Chris Argyris remarked some ten years ago now, there is a **fundamental contradiction** between organisational methods based on authority, and aimed at predetermined common goals, and the fact that the organisation is dependent on data which is in the hands of those subject to this authority, but who are not really concerned with the attainment of those common objectives. This explains the slow but steady decline in efficiency in big organisations, as their, activities, under the impetus of technological progress, becomes more changeable and diversified.

This dynamic, which I described in 1980 in the publication "Les Pionniers d'un Nouvel Age", ("The Pioneers of a New Age)", has also been dealt with by Paul R. Lawrence in "The History of Human Resource Management in American Industry, Harvard Business School Press. See Figure 1: Summary of American HRM Systems.

Developments are taking place at the three great poles of what Kenichi Ohmae called "the Triad Power": the United States, Japan and Western Europe. The United States has a great tradition of mobility, and greater natural resources as well. Japan has a very ancient culture which, up to now, has been able to reconcile organisational constraints with a degree of individual involvement. It is in Europe where, once the benefits of the Single Market are assimilated, that a slow decline in organisational efficiency is due to take place, **unless** the means are found to transform this weakness into a strength. In my opinion this is perfectly plausible.

Figure 1: Summary of American HRM Systems

Policy Areas	*Craft (dominant until 1820)*	*Market (dominant until WW I)*	*Technical (dominant until WW II)*	*Career (Currently dominant)*	*Commitment (emerging)*
Work organization	Master/journeyman/ apprentice work team	Unskilled machine operators organized into work gangs by the foreman	Fine division of unskilled labor with machine pacing	Grouping of individual positions under a supervisor	Semi-autonomous work groups
Rewards	Rates set by individual contracts based on time	Pay by work performance (piece rate)	Hourly pay based on job evaluation	Salaries with multiple levels; raises by merit and seniority	Base salary with gain sharing
Flows	Multi-year mobility from apprentice to journeyman to master: lifetime system	In and out at open market rates; high turnover	Semi-long-term employment; layoff by seniority; exempt career barrier	Long-term employment; career-oriented; up through the ranks	Near lifetime employment; slow promotion; lateral and vertical movement
Employee voice	Direct consultation in traditional relations with power balance	Boss-worker direct relations; power unbalanced	Collective bargaining through union	Individual appeal system	Multi-level consultations with employee representatives
Balance of emphasis on adversarial and mutual interest	Mutual interest Adversarial	Mutual interest Adversarial	Mutual interests Adversarial	Mutual interests Adversarial	Mutual interest Adversarial

(Lawrence 1985)

Three Ways Out Of The Impasse

In effect, Europe has the trump cards and there's nothing novel in the claim that its inhabitants are its major asset. Eastern Europe has just demonstrated this once again. The maturity of Europeans, their trade union tradition (in other words, a tradition of organised, disciplined and orderly collective action), their generally speaking, high level of education and democratic traditions, all combine to give Europe an advantage, which considering the shift of power to "knowledge workers" which we have just predicted for the 1990s, is sure to become a decisive, competitive asset.

But before we get to that point, a big clean-up needs to be undertaken. Even if all the European assets mentioned, exist, one of the serious flaws is the obsession with what is known as "employment". Employment, as opposed to work, and to the necessity of earning a living, is a relatively recent invention, and one I would readily call an invention of the devil. The very expression, the word in itself, is a horror. Imagine a human being letting himself be "employed" instead of employing his own time and competence as he sees fit. Maybe I'm waxing in a philosophical, and even in a poetical vein ! But this obsession with employment is a myth so solidly implanted in Europe, that it takes philosophy or poetry to begin to demolish it. This myth of employment is deeply rooted in our history for three reasons, which I won't dwell on but briefly mention. (1) The fear of misery, going back to the chaos of the Great Depression, when no satisfactory safety net existed. (2) The fear of the loss of social dignity, a sequel to the bourgeois ethics of early industrialisation, which linked social value to the performance of paid work, even if it was degrading. To be, is to be a cog in the machine. And (3), the fear of boredom, which calls the educational system into question, because people should have been prepared to use their time for other things than being permanently "employed". To shelter themselves from this triple fear, our people have obstinately sought refuge in structures, in organisations which as we have seen, bring them none of the satisfactions and opportunities they might have had. From the new perspective we have been referring to, it is, in Frank Doyle's words, as though the need for "career security", based on competence, is replacing "job security". The fact of tying oneself down to a job constraining one to so many hours a day, so many days a year, so many years of one's life, and, on top of that, always within the same organisation, is not going to continue looking like the pinnacle of happiness, let alone a necessity or a price which one is prepared to pay.

Structures are necessary. The experience of the 1980s shows that they must be solid. But they do not necessarily have to be patterned on the armies of Julius Caesar or the Catholic Church, both of which were conceived according to a different unifying principal. In the first place, much more varied and less permanent structures are needed. Instead of the predominance of large bureaucracies, not just public but also private (and even trade union ones), what's needed is a multitude of small, fluid structures. And even large structures can operate under non-hierarchic organisational principles. In fact, for several years now, the Total Quality movement, invented in the West but coming to us now from Japan, implies an alternative effective organisational principle: that of the client/supplier relationship, which to a great extent replaces the hierarchical model. The two diagrams presented below (Figure 2: The Conventional Organisation and Figure 3: The New Organisation), illustrate the shift in emphasis which must take place.

Fig 2

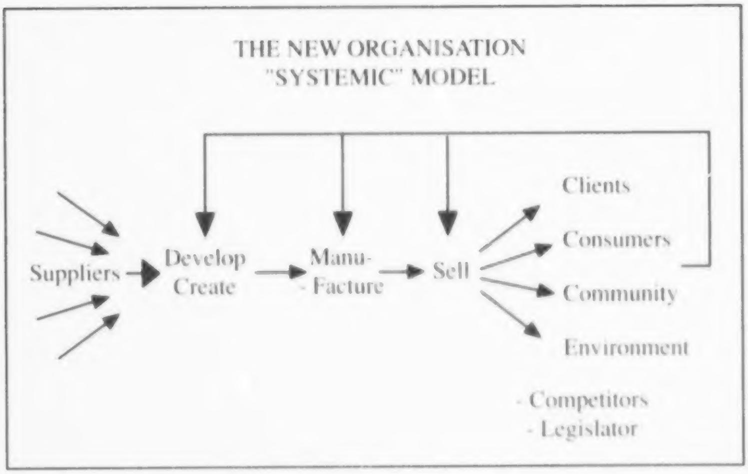
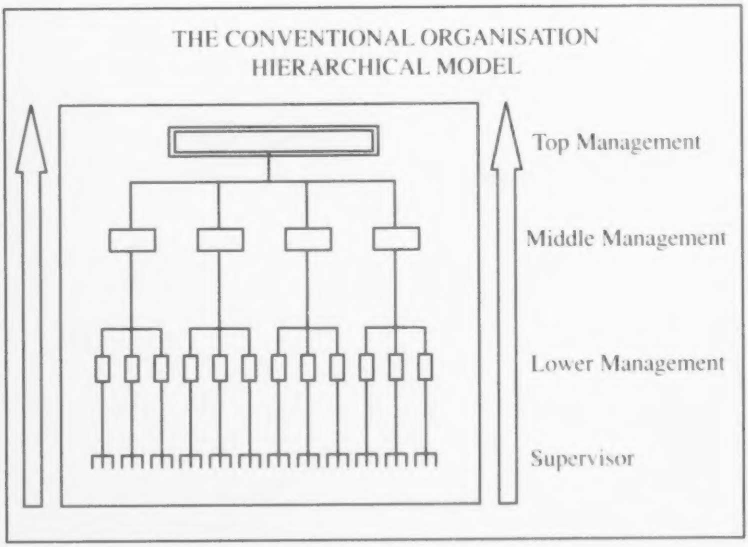

THE NEW ORGANISATION
"SYSTEMIC" MODEL
Suppliers
Develop
Create
Manu-
- Facture
Sell
Clients
Consumers
Community
Environment
- Competitors
- Legislator

Fig 3


THE CONVENTIONAL ORGANISATION
HIERARCHICAL MODEL
Top Management
Middle Management
Lower Management
Supervisor

Whatever the structures, and above all in the case of large organisations, it is important for their proper operation, to minimise the "phantom factory" dimension, which means making sure that people are not prisoners in factories, but rather free people who manage their own lives while passing from one structure to another. In the essay previously mentioned ("Les Pionniers d'un Nouvel Age"), I envisaged in some detail four types of "work" structures corresponding to different ends, where people could involve themselves according to their preferences, age and health.

First of all there would be the **large systems, highly automated, with a very high level of production** and a much reduced level of employment in relation to capital. They would form the infrastructures of advanced societies, providing raw materials and products, and maintaining the necessary communication, financial and administrative networks. To a large extent, it is the very high productivity of these basic operations which would help preserve the competitive position of progressive companies in the world, and allow them to ensure a minimum but decent standard of living for all their members. In other words, they would provide the safety net which is essential for the demystification of employment and the growth of flexibility in society.

In the second place would be the **large service systems, where automation would remain limited despite significant technological inputs**, and human labour would still be relatively important. Here we are speaking mainly about education and research, health, security and defense, public services, as well as consultative and political decision-making systems to deal with questions relating to large communities. In all these cases, however, it would not be a matter of large bureaucracies charged with providing for all needs, but rather of systems which, on the scale of large communities such as Europe, would provide a sort of framework, one could almost call it a "hat rack", on which the numerous specific needs in this domain could be hung. Taking the example of defense or internal security, there is, on the European level, an obvious need for a common, highly coordinated mechanism of defense and overall security, which would have to be undertaken by groups of people falling more so under the category of what could be called "civilian society". Another example is in the field of research. Large networks are necessary to facilitate high levels of quality and specialisation, but there must also be limited, autonomous, entrepreneurial units to ensure dynamism and creativity.

The third sector will be composed of a **large number of organisations, institutions, associations of all types, often ephemeral and disappearing as easily as they are created, usually small scale and**

decentralised. They would have, a clear entrepreneurial outlook and a high level of market awareness in the widest sense, and they would continuously ensure an infinite variety of new products and services. This sector would comprise a good number of non-profit organisations, who nonetheless would look after their own financing, and could therefore be considered as entrepreneurial in the kinds of areas which hardly lend themselves to classic market mechanisms.

It is in this sector that a good many activities are found which are presently handled by large companies, even though they need not be large scale nor permanent. Furthermore, it is this sector which could take care of a large number of services currently monopolised by public or para-public bureaucracies, whose sensitivity to real needs is too limited and whose costs are far too high. Thus, by way of example can be found the cases taken up by the Diebold Foundation or the experiments carried out by the Agnelli Foundation in Turin, and many other activities which would encumber the Public Service domain and keep it from accomplishing its essential mission.

Finally, a fourth sector would be what can be called **"civilian society"**, situated entirely apart from the paid labour market, as is already the case with work in the home, and including the animation of cultural activities, social services at the local level, certain forms of education and certain activities aimed at ensuring public peace and security.

To this sector may be added what Milan Zeleny calls the "self-service society". This refers to the large number of craft activities whose costs, given that their low levels of productivity, are becoming prohibitive, citizens choose to undertake them themselves. In doing so, they make use of new products, "packages" and tools of all kinds which an imaginative industrial entrepreneurial sector will not be slow to provide. By way of example here, one can consider automobile maintenance, renovation and upkeep of dwellings, construction with prefabricated elements, etc., the common characteristic of all of these being that the reward for work is the satisfaction of the worker. This vast sector would also comprise all education, cultural development, personal enrichment, the practice of arts and sports. These activities take place outside of market mechanisms and bureaucratic structures, according to the preferences and imagination of the doers.

If the emergence of these four large sectors takes place in the way we have mentioned, it is easy to see the hopes they justify, not only in terms of quality of life and humanisation of existence, but also from the viewpoint of a blossoming of new industrial companies in the realm of material prosperity and also control of nature. By freeing these companies from their obsession with employment, such a development would open the way to substantial growth in productivity and a flexibility, which, would be one of their main assets on a world-wide scale.

Reflecting on the types of human contribution, and on the kind of work required by these four sectors, one notices immediately a very fortunate differentiation which responds to the natural diversity of individual tastes and preferences. With some imagination, it is possible to conceive of alternating simultaneous activities in relation to the four sectors.

Thus, the first sector, highly automated, requires limited human labour, a high level of responsibility, but leaves little room for personal accomplishment and creativity. This could be seen in relation to short term mandates, following a period of retraining or specialisation. High levels of pay would be provided, which would suit people in the prime of life, to enable them to meet their heavy expenses involved in starting and rearing a family.

The large service systems of the second sector, calling more for vocations, provide well-known intellectual and moral rewards and are thus suited to a regular lifestyle, offering people a reasonable if limited salary and relative security. This sector would suit mature and experienced people who desire to follow a certain vocation.

The third sector, the entrepreneurial sector, would prove attractive to young people, and to the young at heart, who have a taste for risk and adventure. They would be able to get involved without risking ruin in case of failure, but with the prospect of personal accomplishment, and the possibility of making large profits. Once again, this would be neither an obligatory stage nor a permanent condition but would offer an opportunity to discover one's talents, a chance to innovate and experiment, whilst remaining within reasonable limits of security, thanks to the safety net, and the ease with which business initiatives, which are ephemeral by definition, could be launched or wound up.

It would be a mistake to think here only in terms of self-employed business people in the traditional sense of the term. More likely, small groups of people who share a common interest, even temporarily, would agree to work together. This is not synonymous with crafts and trades, rudimentary methods, and low-level technology; in fact quite the contrary. In certain parts of Italy there are already innumerable little businesses, staffed by no more than ten people, but of a very advanced technical nature and with acute market awareness, which have managed to position themselves very favourably, by virtue of their suppleness and efficiency, despite their lack of financial clout.

Efficient collective actions could be implemented in this sector which are completely out of the question for the large hierarchical organisations, where personal objectives don't often coincide with company goals, and where individual contributions are by definition limited. Many years ago, Chris Argyris estimated these contributions to be no more than 20% of what they could be.

Finally, the activities of a "civilian society" would be attractive to a minority of people who find organised work repugnant- the poets, the missionaries, and young people who want to devote themselves to an ideal. But this sector would not welcome intermittent blocks of activities, unless they complemented or enlivened the activities of other sectors, and of course served a training and re-training function as well.

Is this a **realistic vision or an utopia?** I don't know, even though it does seem to correspond to the notion of the "knowledge worker" which Frank Doyle talks about, moving from one company to the other with his portable competence and pension. For this to come about, an enormous training effort will be necessary to prepare men and women for the autonomy to free themselves from structures. It's not a matter of keeping everybody in school for the rest of their lives. It's simply a matter of seeing to it that **working life itself makes learning possible**, and that work adapts itself according to the learning process.

It must be clearly understood that new social and work patterns are only possible under conditions of permanent education, which means that life must be organised in such a way that periods of intensive education and specialised training, permanently alternate with periods of predominantly productive activity. This is a system which makes rapid developments in qualifications possible. A person's formal education can no longer be the end of his/her professional development.

It is important to orient initial education toward training for life and in the intelligent use of time which, to a greater or lesser extent, can be independent of professional productive activity. If there is one pedagogical objective which must be striven for from an early age, it is to learn how to be a free being, living one's life consciously and with human dignity. Otherwise, the inescapable increase in leisure time can lead only to the reign of boredom, spelling ruin for society.

By concentrating on "education for life" in the early years, an early experience of group work and training in socially responsible behaviour, which offers invaluable advantages, is possible. Furthermore, alternating professional activity and training would allow a new life style within the family, and open the way to equality of opportunity for women.

Life-long education could thus become a source of humanisation and personal enrichment as well as becoming a tool in the service of material control. It can thus situate itself in a new way in the context of human progress which is seen as liberation, and not mere subservience to the false gods of profession and career.

Conclusion : The Dynamics of Change

Is it reasonable to hope that Europe will involve itself rapidly and intensely in such a path of evolution to preserve its standard of living and relative position, and at the same time carry out its role in the development of the rest of the world?

Personally, I believe that it is possible, if only because of the fact that when companies realise that they are faced with the demands of a new situation, where competence and motivation command decisive competitive advantages, they will do whatever is necessary to acquire these qualities. In concluding I quote Frank Doyle once again:

> "Human resource management has come a long way from the traditional playing field of labour-management relations, even from the broader concept of 'employee relations'. Containing costs and maintaining management authority to manage the business will remain fundamental objectives. But human resource management will take its place in the Nineties as a function no less critical than any other function in the firm. The 'marketing revolution' of the Seventies may have its analogue in the '**human resources revolution' of the Nineties.** For it will be human resources - more plainly, people - who will be the most critical assets a company brings to its market and customers. Creative human resource management - creative especially to the extent that it is responsive to the realities and sensitivities that 'knowledge workers' will bring to the workplace every day they come to work, will be successful human resource management. The most successful companies of all will be those who elevate their level of commitment and creativity to human resource issues before they have to, just as companies who restructured and globalized before they had to in the Eighties, enter the Nineties on strong competitive terms. *Companies that do not change before they have to, will be defeated by their competitors who do; companies who change early, will make "people-power" work for them.*

The only danger here is that too many companies will realise this too late, because where education, social and cultural transformations are concerned, timing is critical. This is why it is crucial to encourage the launching of a movement in this direction.

For this reason, the EUROTECNET Programme and the Work and Learning Programme have fundamental roles to play. They correspond to the two essential requirements of social innovation:

- A **"thousand paths' policy"** in the initiation of change and the refusal to give up when confronted by difficulties.
- The **"pioneering spirit"** which is based on a sense of conviction, willpower, and the determination to do whatever is necessary.

Chapter 14

Vocational Training Requirements Within A Company-Context
A Trade Union View Point

Karl Steinleitner

The spoken word is binding

Before addressing the central topic of my paper, vocational training within a company context, I would like to give a brief overview of the current state of discussion on vocational training in the Federal Republic of Germany. In so doing, I intend to take a critical look at this topic so that I may clearly present the vocational training situation as it is today. In particular I shall examine **in-service further training**, paying special attention to areas of conflict which affect the interests of employees.

For a considerable time, in-service training has been a dominant discussion topic in political educational circles in the FRG. Major debates dealing with, for example the modernisation of the general and higher educational systems, seem to have been long since forgotten, even though they only date back a mere 10 years, and the real problems which were at issue in those debates, were not resolved.

The **prevalent topic** in educational discussions today is vocational training. It arouses widespread interest in a general public which is not normally bothered about the reality behind factory walls. The responsible politicians, who usually make non-committal statements, or say nothing at all on the necessary structural changes in the public education system, are very eager to publicly express their thoughts, suggestions and forecasts on the design and development of vocational training. The rising tide of specialist congresses, conferences and publications has been overwhelming us for some years now.

The increasing internationalisation in commerce and markets, the ever-increasing rate of technological advances in production and service industries, the demographic problems, have all led to a special significance being paid to vocational training. This will no doubt become even greater in the years to come.

A factor which contributes to vocational training taking a key position in political and pedagogic arenas, is that the developments I have mentioned above, **entail fundamental changes in all types of education**, as well as our understanding of the purpose of education and training. In addition, vocational training as a whole is more and more taking on the pioneering function within the entire educational system in this process of change. Concrete evidence of this exists.

Another contributory element, is the fact that vocational training has a relatively weak legal basis when compared with most other areas of education, and is less determined by institutional and historical conditions. As a result, there is greater freedom of scope here than in initial vocational education at college level. As we are also dealing with an expanding area which is structurally stable, it is not alone possible to implement new concepts in vocational training in ways which are effective and constructive, but these also offer fertile ground for all kinds of projects, models and prognoses.

The actual problem in the vocational training debate is the increasing lack of relationship between appropriate required vocational qualifications, and general educational and social policy. Employees' qualifications, and the lack of them, are not seen as the result of the specific social and selective impact of the education system in our society. Instead, the necessity for vocational training is justified almost exclusively from the point of view of the imperatives of new technology which are presented as unstoppable.

This leads to the creation of courses in further education, which have little to do with either current reality or expected developments, bearing in mind that the education reins have always been held tight. Resistance also, has to be overcome to enable the expansion of training courses to take place. In short, the many pompous statements which have been made about further education being the ' be all and end all' have in reality not been followed through.

How can companies emphatically maintain that the introduction of new technologies results in greatly increased demand for qualifications of a new kind, while at the same time three-quarters of all young people on their first courses at training college are being prepared for jobs which will be obsolete in ten years time, if not much earlier.

Were the forward planning of vocational training of the same quality, as is suggested, in the talk about the intensive further education needed to safeguard the technological and economic competitiveness of German industry, and were the alignment with market requirements, (as the sole principle for organising vocational training courses), as efficient as it is claimed, we may with justification wonder how a shortage of skilled personnel, which companies are complaining of, could possibly have occurred.

However plausible the link between the use of new technologies and growing further education requirements may be, such a link cannot mask the fact that vocational training is in no way different from all other kinds of education in society. Questions considering how much is available, which social groups have access to it, and so on, are resolved as a result of commercial and political decisions. Issues concerning, who benefits, and whether the educational system is emancipating in its effects, or merely creating new inequalities, are ones which have to be addressed by those who have responsibility for organising it. Trade unions have had bitter experiences more than once in their history, to which the growth of worker education groups can be traced back in a significant way.

Despite these critical remarks on vocational training in the FRG, the fact that it is nonetheless being so intensively discussed, and that attempts are made to adopt positions about the future structure of a further education system, shows that we are currently in a **decisive phase in the development of further education.** The times in which it could be had more or less for a song have gone for good. Although today it is still difficult to establish in detail how much money companies effectively spend on their own on-the-job training schemes.

Even if the organisation of labour according to Tayloristic principles, (and here it is worth remembering that Adam Smith saw the latter system to be so opposed to effective learning and education, that he considered it to endanger not only "the healthy ability to discern", but also the "physical integrity" of working people), were to be replaced by new concepts which involve a greater degree of job enrichment through the integration of more tasks, this may not mean better opportunities for learning within companies.

Even if the new concepts talked about in the FRG such as **learning-oriented-work** and **work-oriented-learning** were to become established in manufacturing and service industries, it is extremely difficult to introduce them in smaller companies, so a major part of the problem remains unsolved. How can a workplace be designed in such a way, taking into account the pressurised work conditions, so that it can offer possibilities for learning? It is precisely in those situations where new technologies are implemented to their full potential, where the shift from "working with things" to "working with data and symbols" is complete, that the intrinsic **"educational aspect" of the workplace is lost,** because the established pattern of learning at first hand through showing, watching, and copying is no longer possible.

Moreover, the introduction of new methods of organising labour on the basis of modern information, communication and control technologies, does not change the fact that companies use their own training measures as an political instrument in the economic utilisation of the workforce, and in ensuring the loyalty of employees. Nobody can stop this from taking place, but it has nothing to do with vocational training in the interests of the employees.

It is true that the short-term adaptation measures which predominate in "in-service training" have competence building effects under certain conditions. They do not however lead to a significant improvement in qualifications, nor do they improve the mobility and competitiveness of the employees. On the contrary, as they are tailored exclusively to meet very limited, company and workplace-specific requirements, they make the employee dependent on the company, and bind the employee to certain positions within the company. It is quite clear that the cost/benefit analysis is the major issue for companies here.

If the **advantages of the company as the site for learning** are to be availed of for integrated and future-oriented training, the training must be designed from a content and methods point of view which enables employees to develop their skills from a **long term point of view.** Personal development, and the improvement of working conditions must also be objectives. Such training must appeal equally to the work-related and the broader "personal development" context, as Martin Baethge and his workers have stated : " training must treat cultural, political and the narrower work-related aspects in an integrated manner, as it is only on the basis of this approach that cultivation of interests becomes possible, especially for dependent employees".

There is a further critical problem within current in-service training in its social selectiveness, its propagation of existing inequalities and privileges, as well as the split it creates in the company -external and internal labour markets. This fact is well known and on the whole undisputed. Managers are disproportionately over-represented at in-service training courses. Skilled, semi-skilled and unskilled workers on the other hand have only a meagre chance of being accepted on such courses. Permanent workers also have on the whole a far better chance of attending in-service training than part-time employees or those with unprotected contracts. Employees in industrial branches with a central and future-oriented outlook, are particularly privileged, as are companies with large financial resources. The workforce of the "old industries" as they are called, and especially of small and medium-sized enterprises on the other hand, have virtually no access to training courses at all, although they need qualifications to gain employment in the "new industries". Young employees have more opportunities to go on training courses than older employees, and women are also disadvantaged.

The fact that in-service training heightens the polarisation in the labour market, through practically excluding the unemployed and those threatened with unemployment remains an enormous problem. As a result of this, they are forced to rely, on vocational training schemes financed by public money. This in turn has led companies to think that the quality of external training courses is unsatisfactory, and that the qualifications gained are not good enough to meet company requirements.

At present there are very few scientifically supported investigations into the forms of learning-oriented work and work-oriented learning. Only a few companies can point to concerted attempts in this direction. This type of training attempts to deal with the overlapping objectives of the promotion of a "company culture" and "organisational development". According to this model employees are seen as- continuously learning, always cooperating, behaving responsibly, being team-oriented and highly competent. They are seen as eagerly responding to the learning stimuli in the production process. This view is merely wishful thinking, and this will remain the case until we can prove empirically that the workplace and its tasks contain learning possibilities. We must examine scientifically the extent to which work and production can be utilised for learning, and under what conditions work itself can become an integrated learning/work system. This involves an examination of the criteria which make the workplace simultaneously a place of learning.

The implementation of new technologies alone will not result in economic, social and cultural advances in our society. Although audio-visual systems and computers can be linked with world-wide communication technologies, the same old stupid mistakes can easily be repeated. Helmut Becker's definition of 'performance' as dealing not so much with "the ability to do today, but rather the development of learning potential for tomorrow" should be kept in mind.

As companies nowadays are so keen to talk about their corporate philosophies, in conclusion I will refer to some famous philosophers. Aristotle, Kant and Hegel are in agreement with the critical philosophers of our time, that the task of education consists in helping individuals to think critically about the future. Given the speed of technological advance, and the fact that it is threatening the destruction of our natural bases of existence, people's all-round knowledge, awareness and competencies must be developed. There are no valid reasons from the point of view of building a democratic society and from a social justice stand-point, why the general workforce should be denied the opportunity to develop its full potential.

IN CONCLUSION

Facing up to the Challenge

The main focus in this book has been on improving learning, as distinct from training or teaching. It has been about mobilising the power of the learner - the **learning individual**, the **learning group**, the **learning organisation**.

The common thread running through all of the chapters in this volume relates to the fact, which needs to be rediscovered time and time again, that learning takes place as a result of activities undertaken by the learner. Training delivery systems are only a **means** to learning. The learner must control the learning. All learning therefore must in a real sense be self-learning.

The message for companies is that the vitality of their daily self-learning is an indicator of their medium and long-term success. The self-learning organisation is the one which can cope successfully with the future.

A lot of new "jargon" has been introduced in this publication, including indeed the term "Self-Learning Competency". Terminology has value only in so far as it guides us to a new reality. In our case, this means the development of competent learning individuals and organisations who can ensure the economic and social success of the new Europe. The challenge is to turn the self-learning model into a self-learning reality!

An enormous task lies ahead for European Companies and Training Systems in fully translating the "Total Self-Learning Environment" image into a practical reality.

In the much quoted provocative challenge to the West, the Japanese business leader Matsushita stated that the West will fall behind Japan because it is operating on a Tayloristic model of management and competence development. (see opposite page)

The kind of learning philosophy explored in the EUROTECNET SLC Enquiry, however, is not based on a Tayloristic model. It has its origins in a solid European tradition built on a belief in the strengths and abilities of the skilled worker, who is seen as the backbone of a vibrant economy and an enlightened society. This study concludes that it is through retaining faith in the notion of a highly competent and flexible general workforce, that technological developments will be mastered, which will allow Europe to successfully enter its new phase on the world stage.

A Japanese Viewpoint : "Why the West will Lose"

"We are going to win and the industrial West is going to lose: there is nothing much you can do about it, because the reasons for your failure are within yourselves.

Your firms are built on the Taylor model; even worse, so are your heads. With your bosses doing the thinking, while the workers wield the screwdrivers, you are convinced deep down that this is the right way to run a business.

For you, the essence of management is getting the ideas out of the heads of the bosses into the hands of labor.

We are beyond the Taylor model; business, we know, is now so complex and difficult, the survival of firms so hazardous in an environment increasingly unpredictable, competitive, and fraught with danger, that their continued existence depends on the day-to-day mobilization of every ounce of intelligence.

For us, the core of management is precisely this art of mobilizing and putting together the intellectual resources of all employees in the service of the firm. Because we have measured better than you the scope of the new technological and economic challenges, we know that the intelligence of a handful of technocrats, however brilliant and smart they may be, is no longer enough for a real chance of success.

Only by drawing on the combined brain power of all its employees can a firm face up to the turbulence and constraints of today's environment.

This is why our large companies give their employees three to four times more training than yours, this is why they seek constantly everybody's suggestions and why they demand from the educational system increasing numbers of graduates as well as bright and well-educated generalists, because these people are the lifeblood of industry.

Your "socially-minded bosses", often full of good intentions, believe their duty is to protect the people in their firms. We, on the other hand, are realists and consider it our duty to get our own people to defend their firms, which will pay them back a hundredfold for their dedication. By doing this, we end up by being more "social" than you".

(Matsushita, K. 1985, p. 8.)

This Enquiry has highlighted the inter-connectedness between learning and the ability to compete commercially, open new markets, anticipate change, and build the society of tomorrow. Learning is not the preserve of the Educational and Training Institutes. It is an integral part of everybody's daily life.

For this reason the task of creating a "Total Learning Environment", belongs to everyone.

Three groups of people, however, have key roles to play. These are the policy makers, managers of companies, and training and educational professionals. These three groups of people can become European learning pioneers in their own spheres of responsibility.

The task facing **policy makers** at government and social partner levels is to ensure that the building of the future begins now. Radical steps urgently need to be taken to change the current training and education system, so as the present and future workforce can acquire the deeprooted socio-technical competencies to resolve individual and collective problems. In the formulation of initial and continuing training policies, it is critical that the temptation to look for instant solutions is resisted and the long term view prevails: to paraphrase a saying of Cicero- 'the purpose of learning is to enable people to free themselves from the tyranny of the present'

The **managers of companies**, big ones and small ones, must begin to rethink the way they run their companies so that "timeout" is provided regularly to allow learning, reflection and competence development to take place. An approach should be formulated in which long-term and short-term problems are defined in an integrated business-technical-social manner, to be jointly resolved in an open dialogue between all of the partners involved.

The challenge facing the **training professionals** (in educational and training establishments and training departments), is one of changing their roles from that of "trainer", in the strict sense, to that of a "learning animator". With the necessary support of the policy makers and company managers they can become the change agents to bring about the new European Self-Learning Community.

Annex One

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